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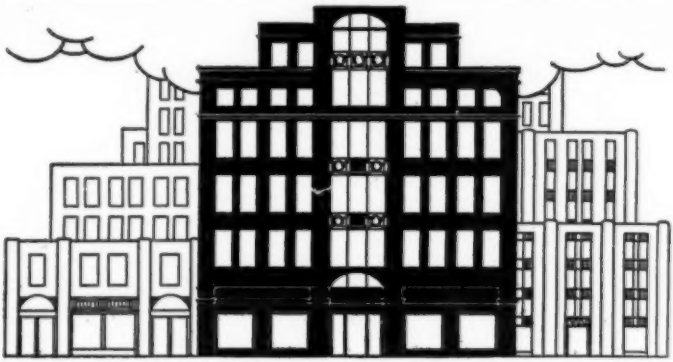

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Color Matching in Real Artistic Finishing

By
F. S. ARAKI

Expert Finisher in charge of Lacquer Dept. at Mikami Studios, New York City, reveals some interesting experiences in restoring and refinishing rare and expensive old works of art such as bowls, vases and screens wherein the skill of an artist is required

"The difference between an expert and a tyro is not in their respective ages. An expert knows ten different ways of doing a thing, and is not satisfied, while a tyro knows two or three different methods for doing one thing and is satisfied.

"I assume each reader of the INDUSTRIAL FINISHING *an expert in his own field, and always intensely interested in what others are doing. That is why I am scribbling these few lines."*—F. S. ARAKI.

COLOR MATCHING on a finish is much more difficult than the matching of colors of paints, inks or fabrics; therefore, it is grippingly interesting. It requires a thorough knowledge of all kinds of finishing methods and full understanding of colors and pigments, which of necessity involves some general ideas of chemistry and physics; then last but not least—an unlimited amount of perseverance.

It is possible to match colors on a surface of porcelain, metal, stone or even glass so nearly perfect as to defy the eyes of the most discriminate under a strong light; and in most cases it will stand scrutinizing inspections under a magnifying glass, as well as the abrasion and alcohol tests.

The French are expert in this line of work. Those who are proficient in this sort of color matching can qualify themselves to highly lucrative positions.

Some of Our Problems

In a city like New York, the natural light is so very poor always—even when the sky is perfectly clear; that is because there are many factories with smoke and dust and other tall buildings which reflect and cast various colors and shadows. We are compelled to work under the daylight lamps.

Quite contrary to the general belief, anything plain and having a shiny surface is the most difficult to match. First comes the white; then the blue and other light tints, followed by all colors of the rainbow. Vari-colored surfaces with patterns and designs are comparatively easy.

If oven drying is resorted to, which is a common practice, many unforeseen obstacles have to be overcome; often it is necessary for one to mix paints for himself to meet his requirements, choosing very nearly chemically inert pigments as possible.

Many excellent matches are made and after a few weeks to

a few months they show different aspects than originally intended. More or less "hit or miss" methods are used through necessity; but in the end, perseverance is invariably rewarded with the desired results.

It is not unusual for us to try 30 or 40 times before we achieve satisfactory results. Never try to finish in one attempt, for it is proved by experience that no such thing can be done. (Here I am talking about artistic color matching only, and not of the commercial kind.)

Apply colors really very thin and tone up instead of toning down. Repeat many times, each time changing the tone of color ever so little, allowing for the temperature effect. Some colors need working in a lighter tone and others in a darker tone than after finishing, and this should be determined by the test plate previously made.

A Beautiful Porcelain Bowl

Quite some time ago we had an occasion to restore a small white porcelain bowl of Kwang Hsi period. It was that rare, expensive, pure-white, egg-shell, shiny porcelain with watermark in it, and was broken in three pieces. The customer was told the cracks could not be hidden when the bowl is held against the light but we could joint together the breaks very strongly and conceal the cracks.

At the outset this looked very easy and simple to us. We were wrong, for this proved to be one of the most troublesome things we ever came across. Many times we just about came to the conclusion that it was an impossibility to match this particular porcelain, yet we were too shamed to admit our defeat; besides the article was well worth restoring. Then, while handling it so long, we had developed a sort of tender feeling or affection for this little bowl. It seemed to us it was a living thing needing our care, and our attitude toward it became that of a kind-hearted doctor doing his best to save the life of his friend.

When at last it was finished, we had expended about $300 worth of time, so our records showed; nevertheless we were highly elated. The contract called for $100 only. Later on I casually mentioned to the customer what we had gone through, and he was so pleased with our work that he sent a check for $200 more the very next day. The bowl was said to be worth $3,000.

A Turquoise Colored Vase

A few weeks ago a porcelain vase about 800 years old was brought to us in fragments. It was of turquoise color—plain and simple and many parts were missing. We anticipated tough going. After a few trials we found we could bring out the exact color, but when we actually worked on it something very peculiar happened.

While the colors of the original portion and built-up portion were matched perfectly there appeared a faint blue border between; while this could hardly be seen at a distance of two or three feet, especially when viewed "straight" or at right angles to the surface, we decided this would not do. It must stand the close inspection and handling due to the nature of the article. One of the easiest methods was to finish the entire top part. However, there was no excuse for us to cover up porcelain enamel, though the customer

might never know. Some more brain work and the job was finished to our satisfaction, which is much more gratifying than pleasing merely the customer.

It now rests in a case of one of well known museums of art. Had we known that before we would not have worked so hard. At any rate we have the satisfaction of knowing that no one will ever know or suspect that this vase was once broken into pieces.

A Chinese Lacquered Screen

One cold afternoon last winter, a great limousine stopped at our door and two ladies walked in. They had been sent to us by the Museum.

"Could you come over to examine our Chinese lacquer screen and let us know what can be done with it?" one inquired politely.

A few minutes later I was in the house of one of the wealthiest families in this country. The screen happened to be of the real Chinesework of Urushi of the Orient, and probably 300 years old. Many of so called Chinese or Japanese lacquer works are often of European origin, though designs may be of China. At other times the designs may look imitation yet they are of the real lacquer. It can be proved by rubbing the surface with alcohol.

As for the determination of the ages of the ancient lacquered articles, there are no positive methods. We simply guess by their designs, shapes and other general appearances—and their mellowness — and we examine them to find out if they were artificially aged. We usually manage to place them within 50 to 100 years, nine times out of the ten. When we are able to cut open and examine the under coatings, we need not depend on our intuition or guess work any longer. The material and manner used are very eloquent; also their odor, if very old articles have been repaired at a later period.

The screen in question was a very large elaborated affair of outstanding merits. It should have lasted for all time, but it had been abused too much in handling. Through no fault of the makers of 300 years ago, the surface of the screen was scratched, cracked and peeled off in a shameful manner.

I liked the screen for its rare grand old tone and was studying the possible methods to be employed in restoring the designs and background, when the question was put to me if we could restore the screen at a cost of not exceeding $1,500. There were eight leaves to the screen and each leaf had two sides, which made 16 sections. If we could manage an average of two sections a week it would take two months. But this was such an unusual job there was no tangible way of estimating with any assurance of certainty.

An agreement was arrived at to keep within the limit placed, yet to turn out as nearly exact work as possible, and six months time given during which we could work whenever convenient. It was hard work, but very fascinating. The background was finished without a hitch. The designs gave us some trouble and proved to be tedious and ticklish. It was finished at last and no one was able to point out the places which were reproduced or restored, the whole thing being in the smooth harmonious old mellow tone.

We do not use any material not known to our finishers, nor do we use any secret processes.

Modern Furniture Styles; Parisian Exhibits

By
LA VERA ANN POHL

One of Europe's major exhibitions of art and design is reviewed by *Industrial Finishing's* Color Specialist and Designer, who considers the displays from the standpoint of Modernism and the new suggestions in colors, lines and materials

THE SALON d'Automne, which opened its doors last fall in Paris in the Grand Palais, presented an assembly of art and house furnishings that left a remarkably vivid impression upon every visitor. This exhibit is always a forerunner of modes which will affect the average citizen. It is important to note that the Salon d'Automne, during the last 15 years, was responsible for much of the interest displayed today in modern decoration and furnishings.

The new furniture on view on the ground floor of the Palais was directly realistic. It presented purity of material without any ornamentation or masking. There were chairs made of metal rods which looked exactly like metal rods. There were boudoirs of pillows and steel and glass—whole houses in miniature which looked like houses and not like castles in Spain.

Glass and metal are increasingly utilized in furniture and, with the mechanics of the metal industry so perfected today because of cheaper

materials and speedier production, indications are that this new form of furniture will be more and more in view.

Few if any works of sensational character appeared in the exhibit, which was so truly international; however, there were many highly interesting ones. There seems to be a trend toward exposure. For example, on a metal chair it is likely the springs will be exposed, and a form of leather lacing adds to the spirit of decoration. There are no pains taken to hide or conceal any structural lines.

The basic principles and requirements of design are in all instances to be considered and brought constantly into use.

Modern contemporary French furniture is various in its reactions. There is and probably always will be in French furniture and decoration, the feeling or sense of decorative appeal. There is a certain feeling of naive conception, or perhaps it is more a subtlety which makes it seem naive. However, the certain little surprise is always apparent—a more jolly air perhaps in a French interior. It lies in the assemblage of color and freer movement in design. What is typical of Austria and Germany in line, is typical of the French. Many times a certain flash of joviality of a broader sweep of line and a bit more extravagance in the wood, the polish and the fabric give it its French title.

This is illustrated in the room scene appearing at the beginning of this article. Notice the living room chairs, cabinet, table, sofa and book shelves. The table is a gem in construction, design, utility and beauty. Made of mahogany, toned to the rose side, with sectioning of curly maple slightly grayish yellow, the top is glass or curly maple brilliantly polished throughout.

Note the cigar and cigarette case or box, constructed and planned as a part of the table, in tiers from the table top itself. It is practical in every sense. The section directly beneath the cigarette case is a door to an interior cabinet lined with shelves for magazines or papers. Then comes the delightfully naive, typically-French, cabinet section done in curly maple; the tray is built to open with the door and can be used for glasses or cups.

Also, note the drawers on either side for spoons, napkins, sugar, etc.—and with the tray directly beneath large enough to hold a good sized box of candy or candied fruits.

All the way around this cabinet effect are doors, and each section is equipped with shelves. The interior, as well as the exterior, is brilliantly polished. The whole impression is that of logic and design par excellence. Beautiful cabinet work, it stands to reason

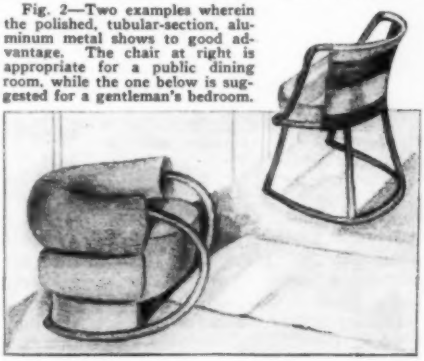

Fig. 2—Two examples wherein the polished, tubular-section, aluminum metal shows to good advantage. The chair at right is appropriate for a public dining room, while the one below is suggested for a gentleman's bedroom.

there can be no visible seam—no visible mark of imperfection.

Notice the chair done in suede leather which has been hot plated or impressed. It is deep and comfortable—cheerful, slightly exaggerated in every line with fullness, deepness, comfort and roundness particularly emphasized. The two plates of curly maple on the posts are the only added decoration, brilliantly polished. The chair is on casters and even though appearing heavy, exaggeratedly so, it is easily movable. The arms are fitted with lighter weight springs to give a certain softness which could not otherwise be achieved.

The sofa is made of the same material, fully as soft, as roomy and interesting; but note that the arms are not developed in the same manner. They come to a slightly rounded off point. The chair has a loose cushion while the sofa has not.

Fig 3—A massive living-room chair in solid color.

Also, notice the corner development of book shelves. These shelves are constructed for any room, cabinets below and above, utilizing a corner space which is many times lost; made of wood highly polished, the effect is unique. One finds them from 4 to 6 or 8-ft. in height—suitable for any room. They also are products of the perfected craftsman.

The two chairs appearing in Fig. 2 illustrate the use of metal in two forms. The small chair above is suitable for restaurants, hotel dining rooms and cafes. It is made of highly polished aluminum—of heavier metal than usual—with a spring cushion seat, heavily upholstered in linen or striped velour. The back is generously padded. Note the simple elegance in construction; this represents good designing.

The other chair is for a gentleman's bedroom; it is done in velour or suede of soft tones. It is also possible to develop this in three tones, beginning at the base with the deepest tone and making each elevation one tone lighter. Note the metal rods, also highly polished, which form the only decoration. Again a simple elegant piece. Color—grays (on the taupe side) to a pale gray and brilliant metal. This chair has an unusually large and deep cushion seat, giving the chair a more than comfortable advantage.

The chair illustrated in Fig. 3 is a living room piece—the essence of simplicity—with a movable or adjustable back .... broad sides, deeply cushioned, upholstered in heavy velour. Color: Rich brown, deep Cerulian blue, wine red or henna. Also an excellent model in crushed velour. The adjustable back with deep cushions are real advantages. A chair of this model would not look good in a stripe or floral pattern. It is massive and its simplicity of design calls for severity of material, making of this a dignified article.

The best forms of furniture designing, like many and most good things in this world, resort to

comparative simplicity—clear-cut, well-defined lines—no lost meaning. The materials involved receive a good share of consideration; complications of all sorts are discouraged. Distortion in color, garish color schemes are the recognized symbols of poor taste and lack of knowledge.

Distortion in furniture designs and complicated types are chiefly characteristic of the amateur Modernist—the man who is not equipped to execute that which is beautiful in the true sense of the word, "Moderne." Such an individual has no right to label his works "Of the Modern Era."

Color Mixing; Tinting

We have always been in the illusion of the theory that any coloring matter combined with a white base produces tints which are in harmonious relation to the color used. Experience has proved that this is not always the case. Frequently, you wonder why you cannot produce a pure shade of pink by mixing a bright red with white. You encounter the same trouble of making tints with blues and various other coloring matters.

The reason for your failure is the lack of knowledge of the chemical constructions of the various coloring matters. For example, a so-called permanent red (paranitraniline) and other coloring materials, particularly those having a sulphur base, will not produce a clear tint with white lead, chrome yellow or any of the lead-based colors. Experience has proved that oxide of zinc, lithophone, titanox and similar basic whites do not show defects in combination with the various coloring matters.

The proper theory to be advanced in order to correspond with the practical experience, should be, to use only such coloring matters in combination which have no chemical reaction. The manufacturer of coloring matters should therefore, advise on the label of each color can, with what basic whites or coloring matter the contents of the can could be used, without detriment to the result desired.—Geo. Whigelt.

San Francisco's Automobile Salon

The old adage, "Civilization Travels Westward," holds true of the Automobile Salon: Paris, London, New York, Chicago, San Francisco. A number of the New York and Eastern exhibits were presented at the Fourteenth Annual Automobile Show. The highest degree of workmanship, engineering and materials entering into the presentation represent the latest trend of motor car manufacturing.

The flashy colors of a few years ago are supplanted by those more somber, and blend in their entirety with the upholstery scheme. The finishes and comments on same have been considered very thoroughly. We are looking forward to the incorporation of color into the body metals which may or may not be the trend of a few years hence.—C. R. Morley.

Impervious Varnish Elects Officers

The Impervious Varnish Co., (mfr. industrial finishes) 436 Seventh Ave., Koppers Bldg., Pittsburgh, Pa., elected the following officers at the annual meeting held recently: President, Adam E. Daum, re-elected; Vice-president, Edward H. Fay; Secretary, Hugh Prentice; Treasurer, Albert H. Braun. These men have been with the Impervious Co., for many years.

Aircraft Refinishing

By
G. L. HARDY*

Revealing details of a refinish job that "sold" an Eaglerock biplane for 30½% more than the owner had tried in vain to get for it previously, the refinish job being completed overnight at a cost of 2% of the selling price.

"We refinish a good many different types of ships each month, and new problems continually present themselves on all-metal, fabric and plywood jobs.

"I have found your magazine in Western Air Express, Boeing, Maddux, TAT, Texas Air Transport, Nevada Air Lines and many other transport and maintenance hangars, so I hope that this article will find favor like production articles have."—

G. L. Hardy

REFINISHING airplanes presents much the same problems that continually confront painters and finishers of any kind of surfaces. Each ship seems to require a variation of preparation and treatment from any preceding job.

Possibly the quickest way to determine how a ship should be refinished is to take into consideration the price that the customer is to pay for the job. From that, one should be able to judge just about the time of preparation and detail that can be allowed for that amount of money.

"How much and how soon?" Get those two points clear, and you can proceed to lay out your routine in a much easier fashion and you have the job partly whipped before starting the manual work.

It is never advisable to guarantee a refinish job on an airplane, as the solvents of a fresh finish will never amalgamate, or bring into balanced suspension, the old preceding coats that are partly or entirely oxidized. The dopes that are loaded with poor gums and scrap film are naturally the first to check, and even the best of old nitrate and acetate finishes can not be expected to come back to their original state of durability. The same may be said of plywood as of fabric. This means simply that the new finish is very little better than the old "under finish."

*With Aero Corporation of Calif.

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The New and Improved
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The
ZAPON COMPANY
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Stored Outside 14 Months

The ship I have in mind is an OX-5 Eaglerock open biplane that has been stored in the open for the past 14 months. It is to be a 3-color job—silver wings and wheels, Milori green struts, propeller and fuselage stripe. The fuselage, spinner, vertical fin and rudder are in cream.

The fuselage and wing construction are in perfect shape, but the fabric finish is very bad. The wings and tail surfaces are quite chalky. No check marks show on the fuselage, but it is quite dirty. The cowling is unchecked but badly chipped in spots. Wings and tail surfaces are too chalky to bother washing and cleaning except around the fittings.

One man tackles the fittings, scraping away the caked grease and spraying off the rest with thinner in preference to gasoline, as thinner has much the best effect in drying out and killing the grease. It is necessary to wipe up the grease as it runs from the fittings.

Cleaning the Surfaces

While this is being done, the helper cleans and sprays the landing gear and wheels with gasoline, following with a wash of thinner which will make the job better and speedier to get at. Thinner, as a cleaner, is cheap to use on most all quick, cheap jobs. This statement may not sound orthodox, but it surely is a practical fact.

Next the wings, stabilizers and elevators are given a thorough dry sanding, using No. 180 sandpaper. Remember while sanding, that it is 100% easier to go through rib-stitching and sharp corners on an old dry finish than it is on a fresher and tougher finish, and the latter mentioned is easy enough.

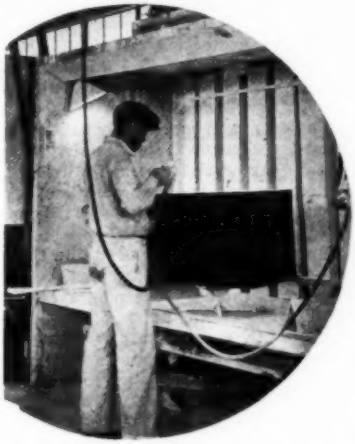
Following this treatment, the fuselage and cowling is washed, using a big handful of U.S.P. grade detergent to a bucket three fourths full of warm water. You may follow with a clear rinse if you wish, but this is an added precaution that is not necessary on the average refinish job. The best plan will be to chamois off the ship and, just before spraying the finish coats, wash the fuselage with thinner or retarder. This will soften the old finish and prevent the new finish from peeling.

Cowling nicks and struts are next given a thorough sanding and feathered out. The fuselage is given a fair dry scuffing.

Primer; Color Coats

Prime all bare metal spots with a *lacquer primer* so that you can spot glaze in a very few minutes. While this is drying, give all sagging fabric enough coats of dope to bring it back to drum tightness. Usually two coats of dope will be sufficient on a refinish job; just so it will pass Government inspection is all that is necessary.

The helper can shield the insignia with masking paste while the finisher shoots the struts first. For real speed on an assembled ship, it is very important to shoot the struts first if they are to be a different color than the wings, it being far easier to paper off the struts than to paper off the wings and shoot them with the striping. The saving in labor is easily 65%, as well as saving a lot of masking paper and avoiding the breaking up good shop routine. The propeller, if made of wood, should be sprayed with the struts, if it is to be the same color.



We can improve his work!

He can regulate the spray nozzle and add more thinner, but that is all. If the finish formula isn't correct for the surface and the conditions he won't get good work. But why should he? That's our job!

A recommended "Impervious" formula will be a demonstrated and proven product for which it is prepared.

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By this time the spot putty should be dry and can be sanded while the struts are drying, or the fuselage and tail surfaces can be sprayed in silver. Silver makes an excellent ground coat for any light color.

Be sure and cover the crash pads if the leather is still in good shape. A good plan for this is to use an old rag pushed under the pad and the loose edge dropped inside the cockpit. Short pieces of thin stick forced under the rag covering, lift the leather clear of the cowling, enabling you to spray the color up out of sight.

The struts and propeller are now papered off and the fuselage washed with straight retarder or high grade thinner. The wings, wheels, wires and fuselage are shot with two or three coats of silver lacquer.

The fuselage will need only a light coat of silver using no retarder, and can be followed in a very few minutes with the green for the arrow stripe that runs the full length of the fuselage. Spray a strip of green about 4 or 5-in. wide just under the edge of the cowling from nose to tail.

Speed Counts

While this is drying out you can mix the fuselage color; clean out the sign brushes for the identification numbers, and cut in the instrument board in dull black. Dull black absorbs the light instead of reflecting like most colors, and this is invaluable to the pilot. The wings may be lettered in a very few minutes after being sprayed. When spraying the wings, it is to your advantage to leave as much of the old numbers showing as possible as its saves laying them out again.

Next, the walks and under side of the wings at the butt end are papered off, along with the stabilizers and flippers. If possible, use drop cloths or some other cover of protection on the top sides of the wings. The fuselage should be scuffed off lightly with No. 220 dry sandpaper or steel wool. A piece of one inch masking tape is used over the green stripe and the arrow and tail are stuck on, and the cream color is sprayed over the top. After all coats are sprayed and set for a short while, the tape is removed and the green stripe is in just as clear relief as though it were sprayed on over the cream finish.

Naturally this is not quite as good as though the stripe were sprayed over the top of the finished coat, but it is by far the speediest process, and that is all that counts on a reasonably priced job. This type of inverted striping might let the fuselage color peel back, while the other type would only let the stripe itself peel—and the latter type of stripe is easier to touch up.

Next, the walk may be papered off and shot black, or it may be left "as is," according to how the time on the job has gone or how the customer desires it to be.

Lettering the rudder, dressing the cockpit cover, removing the papers and the masking paste from the rudder insignia—this just about winds up the job.

Summary of Costs

Now for a little figuring: We find that the material has cost $21.15, and the labor has cost just $25.50, making a grand total of $46.65.

This should not close the story, as there is another feature that might be interesting to know. The finisher started about 4.30 P.M., and the helper at 5.30 P.M., and the ship was ready to fly early

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have bought thousands of gallons of these products that give results not possible with varnish or lacquer

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2. They have a greater depth of film and build far better than ordinary lacquer.
3. We have never seen, even with varnish, a polish of higher brightness. And, unlike lacquer, the finish increases in clarity as it ages instead of fogging.
4. Instead of chalking and checking as ordinary lacquers do, Murphy Flexible Lacquers actually toughen with age.
5. Murphy Flexible Lacquers, as their name implies, are like varnish in having the plastic resistance to the expansion and contraction of wood—a notable failure of the rigid finish of nitrocellulose lacquer. They are unaffected by humidity checking, so much deplored in lacquer.
6. They give the appearance and "feel" of varnish instead of the cold, glass-like surface of lacquer.
7. Murphy Flexible Lacquers are entirely waterproof.
8. Murphy Flexible Lacquers dry as quickly as lacquer, but look and act like varnish.
9. They are more durable than either varnish or nitrocellulose lacquers.
10. They are designed for both interior and severe exterior service.

NO ONE concerned with the finishing of wood or metal can consider his knowledge complete unless he knows all about Murphy Flexible Lacquers. The simple facts about these remarkable products are almost too good to be true. The only real way to learn what they can mean to you in the excellence and economy of the fine finish they give is to actually use them in your own production.

We suggest that you obtain a small quantity of Murphy Flexible Lacquer or write to us for a demonstration.

MURPHY VARNISH COMPANY
Newark San Francisco Chicago
Essex Varnish Company, Newark
(Associate Company) *Baking Material Specialists*

Murphy *Flexible* Lacquers

the next morning. In fact at 10.30 A.M. the following morning it had been inspected, relicensed and at 11 A.M. was accompanying a ship a short way to sea.

In spite of having to work during a very heavy, foggy night, things rolled through without a slip. We had no heat in the hangar, but we used considerable retarder and a good grade of thinner—which we consider half the battle, as the ship's fabric was practically drum tight at flying time.

Please remember this cost figure is only meant as a base to work on—for a ship that is just about in the condition described in the first part of this article. If this same ship had been finished in the day time, the cost would have been a trifle less. Also, better wing horses and ladders would have been another factor of cost cutting.

Before being refinished, this ship had been offered for sale at $1,800 and had been on the owner's hands, for sale, over five months. Within two weeks after being refinished it sold for $2,350, which is all the more remarkable for this particular model and year.

Paint Remover; Alcohol Wash

During the last years of the 19th century an idea was conceived to remove old hardened paints, varnishes and other coatings by a chemical process instead of mechanical methods which were used up to that date. Those methods included the use of a torch, scrapers and other mechanical means to forcibly remove old coatings. A theory was worked up that with the aid of chemicals which would dissolve and otherwise act on the old materials it would be easier to remove same.

In this case the theory was correct, as the same methods used to-day are based on this theory, with the exception that the chemical compositions which have originally been used have been changed considerably. Through practical experience, however, it has been proved that particularly one item is wrong in the use of those chemical compositions and that is in the final instance of cleaning the surfaces. The mistake is made in advocating the use of benzine, soda or other caustic solutions for the final cleaning process.

Such solvents are neither active enough to dissolve the remainder of the materials left on the surfaces, nor will they remove all of the scum and grease which has developed during the process of dissolving, nor will such solvents form a chemical union with the ingredients of the solvents themselves. Therefore, in order to make the theory successful in its practical application we must use such solvents or agents which would produce a perfectly safe surface for the application for subsequent coatings. One of the most easily obtainable materials for this purpose is alcohol which, if used in sufficient quantities, will produce the desired results.

Excerpts from Geo. Whigelt's paper presented at the February Convention of the International Society of Master Painters & Decorators, Inc.

O'Brien Varnish Co's. "Believe It or Not"

The O'Brien Varnish Co. South Bend, Ind., is circulating a six-page folder under the above title. It contains testimonials from finishers in all sections of the country, for this company's 2-Hour Varnish.

Mottled Finish

In this article I will endeavor to outline the application of a novel finish which has been done somewhat similarly before, only with not quite the rapidity that this finish may be applied. The finish when completed is a novel mottled type which has the design characteristics of the mottled celluloid.

PROCEDURE: A coat of colored lacquer enamel is first applied. Let it be assumed, in this case, that cream is the color. When the cream is dry, the surface is sanded lightly with fine sandpaper; a coat of a green, quick-dry, graining ink is applied all over or, if we wish to leave a border of cream, the border of the object to be finished is masked off. The quick-dry graining ink is then mottled with a sponge or, for a better effect, crumpled paper is rolled over the surface.

Of course, the mottling is done before the inks start to set. The ink is left to air dry for one hour or one hour and a half. Then a thin coat of clear lacquer is applied to seal the graining ink. When the clear lacquer is dry, a coat of another colored, quick-dry, graining ink is applied and mottled the same way as was done before —only that blue ink might have been used. When the ink has dried, the masking shield is taken off and a coat of lacquer sealer is applied. The sealer coat is then sanded and a coat or two of clear lacquer completes the finish.

Numerous types of designs may be applied by the different ways, and different objects can be used in executing the mottling; for instance, paper, sponge, coarse brush, split-rubber suction cups or cheesecloth—all give a different type of mottle.

A fairly good imitation of black marble is made up in the following manner:

A coat or two of black lacquer enamel is first applied as the base; then a coat of white, quick-dry, graining ink is applied and mottled. One coat of sealer and one coat of clear lacquer finishes the system.

Note: The quick-dry graining ink mentioned in this article is the same graining ink as mentioned in my previous article.—J. M. Verderosa.

Style demand has convinced manufacturers that obsolescent products are as fatal to their profits as obsolescent manufacturing equipment.

Waukegan Chemical Co. Changed To Brevolite Lacquer Co.

The Waukegan Chemical Co., announces a change in name to BREVOLITE LACQUER CO.

There has been no change in the ownership, management or personnel of the company, the old name being discarded as no longer descriptive of the business or its location.

Since its formation 12 years ago, the Waukegan Chemical Co., has shown a remarkable growth. Production is confined to lacquer finishing materials for the industrial trade, and the company prides itself on its Finish Designing Department which has been unusually successful in originating distinctive finishes for many well known products. A new and thoroughly modern addition to the factory at North Chicago, Ill. provides ample facilities to care for the rapidly increasing volume of business.

Officers of the company are Casper Apeland, President and Treasurer; Emory H. Wilder, Vice President; L. L. Klewer, Secretary; and F. H. Apeland, Assistant Treasurer, Edmond H. Bucy, well known lacquer technician, is in charge of the laboratory and research work.

The factory and general office of the Brevolite Lacquer Co., will continue to be located at North Chicago, Ill., and a Chicago sales office is maintained in the Daily News Building.

Tumble Finishing Wood Yo-Yo Tops

By
W. W. BENNETT

Finishing Engineer for James B. Day & Co., recommends the size, shape and speed of tumbling barrel for this work and explains details of coating the Yo-Yo tops with lacquer and then polishing them to a desirable luster

THE HALF section of wooden Yo-Yo tops can be finished very successfully and at low cost by following these recommendations:

A tumbling barrel which produces the best results is one having eight sides, each side about 12-in. wide and 4-ft. long; one side open for door space. The octagon-shaped barrel is equipped with two doors—one solid like the other sides, and the other with center of door cut out and replaced with wire screen of about ½-in. mesh.

The wood turnings to be finished are placed in the barrel, with screen cover in place, and allowed to revolve until free from dust. The screen door is then replaced with the solid door and the Yo-Yos are ready for finishing.

The barrel should never be filled more than half full, and a separate barrel should be used for each color. Tumbling lacquer is used for finishing of the Yo-Yos. This material can be obtained in any desired color. This tumbling lacquer should be thinned slightly more than when used for coating turnings that have no flat sides, this being done to eliminate the sticking together of the flat sides.

Pour in Lacquer Carefully

The lacquer should be added to the barrel by cupfuls, the barrel being allowed to revolve for about five minutes after each cupful—or long enough to distribute the material evenly over the toys. This process is repeated until enough tumbling lacquer has been added to completely cover the turnings.

The tumbling lacquer is added in small quantities to prevent putting on too much material, which would cause same to pile up and make a rough job.

After an operator has tumbled a few barrels of Yo-Yos, and has determined the proper amount of material to use, same can be added all at one time, providing the material is spread well over the tops.

When enough material has been added to cover the tops satisfactorily, the barrel is allowed to revolve with the solid door in place, until there is no moisture left. The solid door is then replaced with the screen door and the barrel is allowed to revolve for a few minutes to harden the lacquer.

At this stage the tops will show a flat finish and should be perfectly smooth, providing the proper amount of material has

ADVERTISING PAGES REMOVED

been used of the proper consistency. The tops are now ready for the tumbling polish, and the solid door should be put back in place.

Applying Tumbling Polish

The tumbling polish should be added in small quantities and as often as tops show the polish has been taken up; this can be determined by opening the barrel; if tops are dry and show a gloss, more polish should be added. There must not be too much time allowed between applications of polish, or a powder effect will take place in the barrel. Only enough time between these applications should be allowed to take up the polish—that is so that when the next application of polish is made, it will not cut or soften the former applications.

This polishing operation should be repeated until the desired gloss is obtained, at which time the screen door should be put back in place and the barrel allowed to revolve for about two minutes to allow the polished surfaces to harden.

The tumbling should be done in a room temperature of 70° to 80° F. Tumbling lacquer should be allowed to stand in a room of the same temperature, about 24 hours before using.

The tumbling barrel should revolve at a speed of 28-r.p.m. One gallon of tumbling lacquer will cover approximately 275-sq. ft. of surface on birch or maple, such as is ordinarily used for turnings. About one quart of tumbling polish is required for each gallon of lacquer.

Tumbling lacquer should not be confused with other lacquer; for example, dipping, brushing, and spraying lacquers, as this material is made by an entirely different process.

Blueprints of a tumbling barrel such as is specified in this article, or any other information regarding the finishing of these tops, will be furnished gladly by the writer upon request.

Modern Color Trend

This modern color trend,
You wonder what it's all about,
Now let me tell you my dear friend,
The why and ifs, you'll soon find out.

There was a time not long ago,
When everything that you could buy,
Was either drab or white as snow,
You soon tired of it and wondered why.

But now this Modernistic Age,
Has brought about the greatest change;
Colors have become the rage,
From parlor chairs to kitchen range.

When used in proper tints and shades,
That harmonize but do not clash,
You find that color promenades
Ahead of all, just like a flash.

It brings to us such beauty and charm.
That cannot otherwise be found,
Such cheerfulness and restfulness,
To almost everything around.

—Mrs. J. V.

LaTowsky in New Du Pont Job

Announcement is made of the appointment of H. R. LaTowsky as Assistant Sales Manager of the Chemical Specialties Division of E. I. Du Pont de Nemours & Co., Inc. This division markets the No. 7 line of automotive chemicals. Mr. LaTowsky has previously been District Sales Manager of the Paint and Varnish Division of the Du Pont Co.

Valentine's New Executive

The Valentine & Co., (varnishes & colors) 386 Fourth Ave., New York City, announces that Mr. E. W. Michael, for many years Regional Director of the Glidden Co., and of Adams & Elting Co., resigned as of February 1st to go with the Executive offices of Valentine & Co.

New School Furniture To Be Brown

By
*WM. J. MISKELLA**

Consulting Engineer on Finishing Problems reveals what has been accomplished and accepted in the work of standardizing finish colors for four different woods used in the manufacture of school desks and seats

ON JANUARY 1st, 1930, there was released for the use of those in the finishing industry, a set of standard panels on three different kinds of woods—the finish of all of which matched perfectly in spite of the variations in the woods and other variables not heretofore considered. This was the result of months of laborious research and laboratory work in determining upon the best methods of procedure.

The idea was acceptable to the Simplified Practice Division of the U. S. Department of Commerce, which has done such fine work in many diversified industrial channels. This is the first time that a single wood finish has received the attention of so many competitors and men in various walks of life. It required some one to take the lead and this was done by those organized to give better service to the schools of the nation in the matter of furnishing them with equipment that will be more uniform in color.

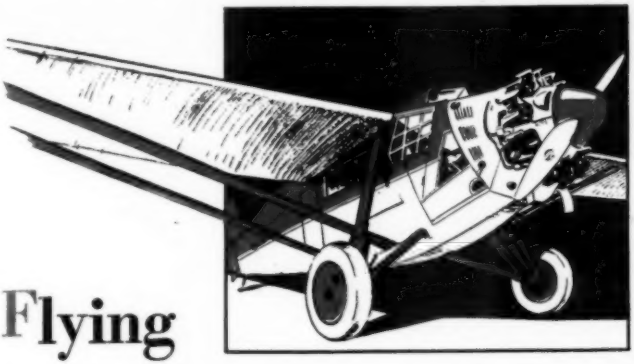
One of the first things to be discovered was the fact that building architects, as a rule, dictate the finish that is to be used on the building trim within a school; and, after that it is up to the furniture manufacturer to match the samples submitted, making the furniture harmonize with the finish the architect specified for the building.

This, obviously, was the wrong procedure. When one stops to consider, he fully realizes the staining and finishing of the building trim can be varied without much trouble or expense; but when it comes to making school furniture match the finish of the trim, he finds there are wide complications involved that reach out into channels which, at first thought, were not taken into consideration.

Matched Finishes

When a special finish comes into a finishing room to be matched it means, first of all, that someone will have to assume the responsibility of making up the stain and filler to be used in the finishing of the particular order in hand. The regular formula for the factory standard cannot be used. It also means the doctoring and shading of the factory standard with possible deteriorating effects after the article is placed in service. For example, sun-fastness, stableness, and other character-

*Author of The Practical Finishing Series.



Flying colors that stand the gaff

Trade-mark Registered

Intense heat—freezing cold—pounding hail and scouring wind give airplane finishes the acid test. In this field, as in every other, Sherwin-Williams has perfected finishes to master these exacting factors. New standards of visibility, durability, smoothness of texture and richness of color have resulted. The combination of S-W Nitrate Dope, Semi-pigmented Dope and Aero Finish gives a flexible surface light in weight and strong in protection.

Write for "Airplane Finishing Specifications." The Sherwin-Williams Co., Dept. 708, 601 Canal Road, N. W., Cleveland, Ohio.

SHERWIN-WILLIAMS AERO FINISHES

For Planes, Hangars and Equipment

istics would contribute to the physical properties of the resultant formula.

For Four Woods

Anyway, it was soon established that color standards would have to be made up and that these would necessarily have to be applicable to plain oak, quartered oak, birch and maple. If any reader has ever had the task of applying a finish to these four kinds of wood and has succeeded in making them look alike after the finish has been completed, he will know what problem had to be faced.

After a certain definite stage had been reached, a meeting was called at which were present over 100 representatives of furniture organizations. The facts that had been established were presented to these representatives after which a committee—with the power to act—was selected to work with the research laboratory and to pass upon the results that were attained. When a satisfactory step had been made they were to have it standardized and published.

Finally, it was thought best to call a conference and get a mass opinion on the results that had been developed after the long and laborious study in which hundreds of wood panels on the various woods had been made up and discarded. At this conference there were representatives of furniture manufacturers, distributors, architects, superintendents, and purchasing agents.

Value of Standard Colors

All the representatives present recognized the economic value of the work that had been done and approved the standards that had been created. They were quick to note that the expenditure of much time and labor was responsible for getting such results as were presented.

Too, it was recalled that the experiences of the past—such as increased cost of the furniture, due to the special treatment needed to make the finish match a particular sample submitted; the discordant effect created in the school room by the variety of finishes on the different equipment items installed, and so on—would not be repeated after the new system had become established.

Sample Finished Panels

Hundreds of sample panels were made up, using the separate staining and filling operations. The grain and the texture of the wood alone was cause for wide variations, not only in the woods that came from different parts of the country, but even in wood that came from the same tree. Then there was the varying conditions due to the way in which the light affected the appearance of the finish; and, in addition, the fact that a particular sample would match perfectly when viewed from one direction, but not match at all when viewed from the opposite direction.

All of these factors brought up the point of establishing a maximum and a minimum limit, which was done by making up sets of standard panels in groups of three; the medium shade, which was the standard, and the two panels establishing the allowable limits. These sets were repeated for the three kinds of wood regu-

Editor's Note: See editorial on page 114, in the December issue, which covers the work done previous to establishing the standard.

LINGERWETT

is NOT "just another remover"

THERE are literally hundreds of removers on the market. Most of them will remove paint, varnish, enamel, lacquer, and shellac. Give them enough applications and enough time and they will all do the job.

BUT—only Lingerwett will give you the quickest action with the least material. One application will go through coat after coat, and with astonishing rapidity. Two or three applications will quickly lick any job you can put up to it.

NO—Lingerwett is not "just another remover." It is a *different* remover and gives *different* results, as thousands of users, big and little, know to their great satisfaction.

Incidentally, Lingerwett is the largest selling remover in America, and it got there by being the best.

You don't have to take anything for granted. You can find out the facts for yourself right on your own work. Mail that Free Trial Can coupon now and learn, first hand, without risk, how Lingerwett can save you money and speed up your work.

The FREE TRIAL CAN will prove to you its real superiority.

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119 Chestnut St., Newark, N. J.

Please send me a free trial can of Lingerwett Remover.

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larly used in school furniture—plain oak, quartered oak and maple.

Under the new system it will be possible for a school to place an order for some furniture today, specifying the certified color; and in two, three or four years from today, the same shade or color may be had on additional equipment that may be installed alongside of that represented in the present order.

The architects will know what the standard color of the equipment is and will be able to choose an appropriate and harmonious color for the building trim, which will mean that the finish will not have to be made special but may be selected from the same materials as were used by the furniture finishing concerns.

Other Applications

While this development and research work was done primarily on school seats and desks for the pupils, there are other lines yet to be included, even in the field of school furniture. What about the office desks, bookcases, kindergarten furniture, laboratory furnishings, domestic science equipment, as also the art and manual training departments? To this list could be added the cafeteria equipment, lantern slide cabinets, clocks, and other items too numerous to mention here. There is even the angle of imitation wood grain finishes on metal, which has not as yet been established.

At any rate the new order of things will simplify matters for the finishing foreman and the agitation and interest created in this school furniture problem will have far reaching effects. No longer will it be necessary to make a special matching job out of each piece of furniture on a certain order, for these standards are so far ahead of anything heretofore produced that the net result will be one of great advancement.

How It Will Work

Many, of course, will be interested in knowing the process used in finishing the standard panel samples, but I am not permitted to give out that information at this time. Anyway, it is not expected that the various manufacturers who supply stain and filler to the woodworking industries will want to follow the exact methods that were used in making the sample panels. Rather they will prefer to change their own formulas to make the color conform to the standard established by the school furniture trade. In doing so, however, they will have to be careful to avoid marketing finishing materials which will not be stable and which will not change when the rays of the sun, passing through an open school window, fall directly on the wooden surfaces.

This, incidently, produces a change that is entirely apart from that made when the sun's rays pass through the window glass. In other words, the ultra-violet rays of the sun are intercepted by the window glass. This and other factors such as separation, stability, neutrality and so on are all subject to the careful scrutiny of the laboratory before it may be said that the new formula is perfectly all right.

As previously stated, the work done on this problem will have a far reaching effect and will be discussed to a wide extent as time goes on. There will be manufacturing difficulties to overcome and, naturally, there will be application questions to be settled, but

This test has cut costs in scores of processes

Try it, Mr. Chemist. We send you a sample of Butanol free

GENTLEMEN: In order that you may make a test with our versatile alcohol, Butanol, we want to send you a sample free. Butanol has cut costs and contributed to the improvement of many different processes. We could cite you several remarkable examples of the ingenuity and resourcefulness of alert chemists in utilizing this remarkable product.

A test is all we ask. A test in your own laboratory where you can find out just what this versatile alcohol will do. It is entirely possible that Butanol can simplify or improve your present production.

This free sample will be sent to you without obligation of any kind. Just fill out and mail the coupon at right.

What is Butanol?

Butanol is our trade name for normal butyl alcohol of exceptional purity. It is a solvent, a blending agent, a dehydrator, a penetrant, a defrother and a base for a multitude of useful organic products.

Butanol

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5

Commercial Solvents Corporation,
Terre Haute, Indiana.

Gentlemen: Please send us your free test can of Butanol at once.

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City.....State.....

after they are all ironed out, every one concerned will be much better satisfied, especially the pupils and the teachers who have to look at the finishes every school day. Unconsciously, of course, but nevertheless it is true, the effect of discords in color is ever present and does have its effect upon the nervous system.

Tumble Finishing Wood Handles

The tumbling barrel offers an economical means of finishing wood handles and other small wood parts requiring a natural wax finish. Two operations, sanding and finishing, are often accomplished in this manner in one operation, and the attendant may be an unskilled laborer.

Barrels suitable for this purpose are mounted to rotate on their longitudinal axis, and a hinged door in the side of the barrel is arranged to admit and release material to be finished. The size and design of barrel most suitable, of course, will depend somewhat upon the size and shape of the pieces to be finished, and the quantity produced.

The process is simple. Small wood chips, shavings and pieces of block paraffin are placed in the barrel until it is about one fourth filled. Using an ordinary scoop shovel, the turned handles are shoveled into the barrel containing shavings and paraffin wax. When the barrel begins rotating the handles are tumbled or agitated so that each one is continually in motion and always shifting its position. This rubbing contact with the wood chips and shavings smooths the surfaces of the handles to be finished and at the same time their rubbing contact with the blocks of paraffin tends to work the wax into the pores of the wood, producing a natural wax finish.

The length of time required to produce an acceptable finish depends upon the kind of wood and the shape of the part to be finished. For instance, turned wood handles such as are used on tire pumps—made of oak or hickory—require about 20 minutes tumbling time. This time could be reduced on a wood that is less brashy but closer grained.—P. C. B.

Joseph G. Denny Dies

A notice from Denny, Hilborn & Rosenbach, Inc., Philadelphia, Pa., states:

"It is with deep sorrow that we announce the death of our President, Mr. Joseph G. Denny on February 3."

William J. Harris With North Bergen Varnish Corp.

The North Bergen Varnish Corp., (mfrs. of varnishes, lacquers and enamels) 989, 39th St., North Bergen, N. J., announces that Mr. William J. Harris has joined the organization as General Plant Superintendent. Mr. Harris has been identified with the paint and varnish industry for over 35 years. He was formerly with Devoe & Raynolds, Murphy Varnish Co. and the Essex Varnish Co.

REZYL LACQUER

Outlasts Spar Varnish

Which finish would your customer choose? Surely not the Spar Varnish which cracked and chalked after seven months of exposure . . . not when exposure under identical conditions scarcely touched the lacquer film formulated with Rezyls!

Many similar tests establish the extreme durability of Rezyl-formulated lacquers. Exposed to ultra-violet light, Rezyl, clear or pigmented, lacquers outlast other films as much as three to one.

In addition to imparting durability, Rezyls are true solvents of nitrocellulose, they reduce the nitrocellulose requirements, and are entirely suitable for lacquers to be used for finishing and refinishing wood and metal for indoor and outdoor service. Many lacquer users are now getting these excellent results from Rezyls in their clear and pigmented lacquers.

Investigate Rezyls. Let us send you complete information on this and our other lacquer ingredients: Rezyl Balsams for plasticising; Teglac for furniture lacquers; and Ethyl Lactate, a high-boiling solvent. Use the coupon for convenience.

Industrial Chemicals Division

American Cyanamid Company

535 Fifth Avenue New York

American Cyanamid Company
535 Fifth Avenue, New York

I am interested in Lacquers containing Teglac or Rezyls for use in the applications checked.
My lacquer supplier is .....

Furniture	Textile	Clear	Wood
Industrial	Automotive	Pigmented	Metal

Name .....

Address .....

Mark for attention of.....

A Hole Filler Putty

In emergencies I have made hard putty, for filling holes in castings, by adding common starch to clear lacquer, mixing the two until the mass is "like mud." This putty will dry very hard and will be quite hard to sand. To make the same putty softer, add some air-float graphite to it. This will sand much easier and, as graphite will not bleed, it can be sprayed over with white enamel.—A. L. Medel.

Where to Cut Costs

"A stitch in time saves two in the bush." What? That's it, "Saves nine."

If a reasonable amount of care is exercised in the first operations of wood finishing, the success of the final finish is increased 50%.

"The Valspar Corporation" Announced by Valentine & Co.

Formation of The Valspar Corporation to function as a holding company for the varied interests of Valentine & Co. both here and abroad is announced by L. Valentine Pulsifer, President.

"The new corporation will also act as a medium for the acquisition of such new units as may from time to time prove advantageous in the supplementing of the Company's merchandizing and manufacturing activities," Mr. Pulsifer stated. "This step is taken in the belief that a completely rounded unit, capable of operating in every attractive field within the paint and varnish industry, is the one most assured of future sound and profitable growth."

The Valspar Corporation will have its headquarters in New York, and its officers will be the same as those of Valentine & Co. Through Valentine & Co., The Valspar Corporation will own a majority stock interest in the Cie. des Vernis Valentine, its French subsidiary, all the stock of the Con-Ferro Paint & Varnish Co., of St. Louis, Mo., and a substantial stock interest in one of the oldest and best known English paint companies. The vigorous program for the expansion of the Company's activities which has been under way for some time, contemplates further additions to this group of complementary units.

The Valspar Corporation will own through subsidiaries three modern well equipped plants in the United States—one in Brooklyn, N. Y., one in South Kearny, N. J., and one in St. Louis, Mo. These plants are strategically located to serve both domestic and export markets, and further extensions to the South Kearny plant, which is on both rail and deep water and has a ground area of over 14 acres, will be undertaken to accommodate the corporation's increasing lines. The Cie. des Vernis Valentine owns an up-to-date plant in Paris, France, which in addition to its large lacquer facilities, has recently been equipped to manufacture all types of paints, varnishes and enamels. The company's English affiliate manufactures the Valspar products under the Valentine formulas and processes in two plants in England and one in Australia.

The total sales of the companies in the Valspar group were between $11,000,000 and $12,000,000 in 1929.

IMPORTANT NOTICE

The Summers Manufacturing Company, Inc.

Formerly

LANDRO-SUMMERS COMPANY, Inc.

Will have an IMPORTANT ANNOUNCEMENT to make in the next issue of this Magazine

THE SUMMERS MANUFACTURING COMPANY, Inc.

12132 Woodrow Wilson Avenue Detroit, Michigan

Pentexel for Lacquers of excellence

THE higher solvent power of PENTEXEL allows for an increased amount of hydrocarbons—with attendant lowered cost—and higher lacquer quality.

The excellent blush resistance of PENTEXEL permits the use of an increased quantity of rapid evaporating solvents, not otherwise usable because of poor blush resistance.

The slow evaporation rate of PENTEXEL promotes good flowing and allows amply for levelling of the lacquer film.

Thus, an excessively high quality product itself, it exerts a marked influence upon the entire process, making possible the inclusion of many low cost elements, with perfect safety, which might otherwise be considered hazardous.

PENTEXEL is stable—compatible with all pigments—and, an excellent gum solvent. Nevertheless, its cost is low.

The SHARPLES SOLVENTS *Corp.*

2304 Westmoreland St., Philadelphia

548B Railway Exchange Bldg., Chicago, 501A Fifth Ave., New York

Early American Furniture and Finish

By
J. K. COOPER

Calling attention to the styles, woods and finishes characteristic of Early American furniture and explaining how to finish restored and reproduced pieces of this furniture.

IN THE EARLY days of American history it seems that New England attracted more skilled artisans than the other colonies, and a considerable variety of furniture was made. Among the most notable examples of early American, which generally means New England, is the oak chest which started as a piece of seamen's furniture. When first adapted for home use, it was made larger, and when decorated with carvings became known as the Hadley chest. Later, drawers were provided and the chests were made of walnut, maple and mahogany. In its final form it became the highboy with many drawers and fancy drawer pulls.

Furniture Styles and Woods

Other New England examples are the banister-back chair in walnut, the butterfly table usually in maple, the pine slat-backed rush-bottomed chairs and many types of Windsor chairs in hickory and maple with pine bottoms; also the spread-leg draw-top Providence table, the Governor Winthrop desk in walnut or mahogany with flat or serpentine front, and the pie-crust table.

In 1720, mahogany came into use and then followed the reproduction of Chippendale, Sheraton and many other types. The Dutch Colonial furniture included mostly high linen-chests, oak or maple settees, folding tables and deep pine rockers.

The Dutch were great for painted furniture. Rush-bottom slat-back chairs and settees were painted black or gray and decorated with simple floral designs in red, blue and yellow. Cupboards were painted black and blue outside, and yellow, red or brown inside.

By 1750, mahogany had won its way to the front, and in Philadelphia it was used on all the best work. Curly maple was often used also. Many of the famed Philadelphia Windsor chairs, both hoop-backed and comb-backed, were made of birch.

In reproducing American Colonial finish, a lot depends on the wood. The Colonial finishers and cabinet makers probably rubbed oak and walnut with hot oil or wax and French-polished their mahogany; but whether we use these woods, or pine, cherry or birch, our present-day finishes must be used in various ways to imitate the aged appearance of the best preserved antique finishes on oak.

The standard shade of Jacobean oil or water stains may be used, but the finisher must high-light the panel centers and raised sur-

CORONATION RUG, the only one in existence, was used at the coronation of Shah Safi of Persia, 1628. Courtesy of M. Chamalian, N. Y.

WEARS ON AND ON . . .

like the work of a master craftsman

CENTURIES ago, unknown craftsmen spent years of patient toil to produce an Oriental rug that the world recognizes today as a masterpiece. Into it they wove a beauty that time has only mellowed, a durability that has defied the constant tread of thousands of pairs of feet.

Remote though it may seem at first thought, there is a kinship between du Pont finishes and this old masterpiece of the weaver's loom. The beauty of Duco, its amazing durability, are the fruit of years of effort on the part of du Pont chemists and engineers. Every gallon of this finish is the same perfect product of the great du Pont research and development organization.

The durability of Duco, Du Lux Varnishes, du Pont Wood Lacquers, 1985 Sealer and other du Pont finishes, is the direct result of du Pont's vast resources. It is the dominant reason for their fast-growing use among makers of fine furniture.

E. I. DU PONT DE NEMOURS & CO., Inc.
Industrial Finishes Division, Parlin, N. J., Chicago, Ill., San Francisco, Cal., Everett, Mass., Canadian Industries Limited, Paint and Varnish Division, Toronto, Ontario, Canada.

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1. Vast research and development organization.
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4. Technical chemical service.
5. Technical engineering service.
6. Sales and service organization.
7. Warehouse and delivery service.
8. Color advisory service.

The Duco Oval on tag or seal helps buyers identify a Duco finish on many leading lines of furniture.

DUCO . . . made only by du Pont

faces. This is done while the oil stain is still wet. Great care must be exercised when shading from light to dark. In the case of water stain, fine sandpaper is used after the stain is dry. No filler is used; a protective coat of wax is applied and rubbed to a dull finish.

To Finish Walnut

For walnut finish use a stain of standard American walnut, or a trifle deeper in color. It may be an oil or water stain; filler is optional for a William and Mary design, but is always used on Queen Anne and such Georgian patterns as may be executed in walnut. The protective finish consists of shellac with two coats of rubbing varnish or three coats of lacquer. Rub to the dullest finish possible. For a mahogany finish on Queen Anne furniture, the stain may consist of 2-oz. of red and 4-oz. of brown dry stain dissolved in one gallon of hot water, or for Queen Anne, Heppelwhite and Chippendale, use 6-oz. standard Adam dry stain straight.

The latter is sometimes highlighted by sanding lightly in panel centers and around drawer pulls, and shaded deeper around mouldings with jet nigrosine. All the work is filled with red or brown paste filler. In case of Sheraton, red mahogany filler is all that is needed to provide the necessary color; for a protective finish, shellac, rubbing varnish or lacquer may be used.

Maple and Pine

Maple was a very popular wood for the early American furniture, and it is favored at present for our reproductions of today. The stain should consist of walnut crystals, aniline red and aniline yellow powders combined in a water solution to give the wood that old mellow aged appearance. The formula must be varied according to the wood to get the right effect. A protective coating of clear lacquer or shellac is then put on and the surface is waxed to a dull finish.

Pine is in demand today, as many of the corner cupboards and blanket chests and other types of chests of early times were made of pine. Orange shellac is an excellent coating and is just right in color for a true reproduction of the early pine; it is rubbed dull and waxed.

Box Co. Installing Modern Equipment

In line with the industrial expansion and modernization schemes recommended in the recent Hoover conferences, the Robertson Paper Box Co., Inc., manufacturer of folding paper boxes, has started construction of an extensive new boiler plant addition to its Montville, Conn., plant.

The structure, which is to be of modern fireproof construction, will house two new 200-h.p. horizontal return tubular International boilers fired by a Kennedy Van Saun Coal Pulverizing unit.

The company operates its own paper mill and the new boiler unit will furnish steam for the paper machines and for a new 90-h.p. Lee Steam Turbine which will drive part of the paper making equipment.

Silk Screen Methods of Reproduction

The Naz-Dar Co., (silk screen process paints, equipment & supplies) 4014 N. Rockwell St., Chicago, is distributing an interesting and informative book entitled "Silk Screen Methods of Reproduction," by Mr. Bert Zahn. The book includes detailed and specific information about the decoration of various articles, lettering, trademarking and sign work by the silk screen method. It gives complete directions for this work as to material, equipment and methods. There are 151 pages, size 6x7¼-in. with over 100 illustrations. This book is bound in red leatherette and sells for $5.00 postpaid to any point in the U. S.

Highlighted Furniture Finishing

By
C. DAN YOUNGS

The purpose of highlighting, the importance of placing it properly and how the effects are produced according to several practical, rapid and economical methods used by modern finishers.

THE TREND of recent years towards the acquisition of the beautiful for the modern home has taken the furniture manufacturer back through the years to "ye olden days," when the making of a piece of furniture was a long, tedious job and the proper finishing of it was a matter of artistry.

This trend is apparent today in the methods of highlighting or shading, which is so prevalent on the better classes of furniture that are finished in the natural; that is, where the grain is not hidden or obscured by pigment enamels.

Primarily, it is supposed to be an aping of the wear of service during a period of time, and since the aged finish showed the most wear about the parts that were handled most frequently, those parts are now made lighter in tone. Still, it is a too common occurrence to walk into a furniture store and see the shaded or darker places around the parts that will be handled most frequently, thus making an anomaly of the idea behind the popularity of the highlights and their intended effects.

It is an axiom, or should be, that in all finishing of this kind, there must be no line of demarcation between the lighter and the darker parts. They should blend into each other gradually—almost imperceptibly; otherwise the intended effect is entirely lost.

Methods of Highlighting

There are several methods of blending to produce the desired highlights. One is to use water stains of unequal reduction; that is, spray the entire surface first with a weak solution of the stain, and then spray the parts desired darker with a stronger stain of the same material.

Another way to obtain the desired effect, when using water stains, is to wet the parts that are to be lighter with clear water, and then spray the entire article while the treated surfaces are still wet. This acts the same way as a weaker solution; the water on the piece under the spraying serves to weaken the stain that hits those parts.

Some expert highlighters make these two or more tones with a stain of the same strength, but they secure the highlight effects through a clever manipulation of the spray gun. The workman holds the gun at an ordinary distance from the piece where the darker shade is desired and, as he approaches the places to be made lighter, he gradually draws the gun away, at the same time gradually reducing finger pressure on

the trigger so that what is practically a mist coat only, reaches the parts to be left lighter.

With oil stains it is a better practice to secure the highlight effects by means of wiping, bearing down harder on the wiping cloth where the tone is wanted lighter and wiping lighter where a darker shade is wanted. This process requires skillful manipulation, however, for it is so easy to leave ragged edges and edges that are not properly blended together.

In some cases this highlighting is done by lightly sanding the stained surface, either oil or water stained, where it is to be highlighted, but here also it is difficult to avoid leaving a sharp change from light to dark.

Where the work is a matter of quick production rather than artistic finishing, almost the same results may be obtained through use of shading stains applied after the surface has been stained and filled. This is a matter of skillful gun manipulation—by lightening the spray coat as the border line is reached and only using a mist coat to approach the light areas. It is a good idea, however, to spray a coat of clear lacquer over this blend in order to protect it and level off the surface.

By means of the above methods it is possible to closely approximate the old time antique furniture, which is so popular today, and to bring forth furniture that is not only usable but which also imparts an element of beauty to the home.

Tape Masks Sandblast

We have read with considerable interest the article entitled "Sandblasted Antique Oak Lacquer Finished," by Mr. E. T. Miller, on page 50 in the January issue, and are pleased to advise that we have recently been doing a little experimental sandblasting—using some tape of our own manufacture to protect part of the surface from the blasts of abrasive.

We find that if a strip of industrial tape is placed on a sheet of metal or a piece of wood, or any other material, and then the sandblast is directed against it and around it, that the surface not protected by the tape will be affected by the blast, but the portion that is covered with the tape remains unchanged.—The Seamless Rubber Co.

Biax's "Power Equipped Hands"

Biax Flexible Shaft Co., Inc., (flexible shafted power tools), 20 E. 17th St., New York, N. Y., has just published a booklet illustrating and giving specifications on flexible-shaft tools for "grinding, drum and disc sanding, snagging, filing, wire brushing, buffing, polishing, drilling and other cutting and cleaning operations on steel, sheet metals, iron, bronze, brass, aluminum, copper, monel metal, nickel, chromium, wood, bakelite, fiber and rubber." This illustrated booklet contains 12 pages, size 8½x11-in., and is printed on coated stock in two colors.

Maynard Joins Hoboken White Lead & Lacquer Co.

H. E. Maynard is now associated with the Hoboken White Lead & Lacquer Co., Hoboken, N. J., as Sales Manager of the Industrial Division. This company manufactures a complete line of industrial finishes.

Silver Jubilee for Paasche Airbrush Co.

The Paasche Airbrush Co., 1921 Diversey Parkway, Chicago, Ill., is now celebrating its Silver Jubilee anniversary. At the recent annual meeting, Mr. Jens A. Paasche, President, spoke of the development of modern aircoating methods since he entered the airbrush field 25 years ago. The first patent was granted Mr. Paasche in 1905 and since then the airbrush has developed to meet all the many diversified aircoating, finishing, coloring and painting needs of industry today.

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Insures an unobstructed interior view of drums, cans, tanks and cylinders.

HERE is a device for inspecting empty containers, checking contents, or making sure "empties" *are empty* before returning to shipper.

The Drum and Barrel Inspection Lamp is a really safe and efficient tool for the inspection of new and used drums, barrels, cylinders, cans, tanks, tank wagons and tank boats. It is in general use also at powder plants, flour mills, coal mines . . . wherever a spark may mean either property destruction or loss of life.

It is entirely portable, and current is supplied by four standard flash-light cells contained in the handle of the lamp. It throws a powerful white light that penetrates every corner and crevice of the container. Constructed of heavy aluminum, it has a specially guarded lens, and withstands rough handling. The automatic light switch is totally enclosed and vapor-proof.

The Drum and Barrel Inspection Lamp is sure to return its small cost to you many times over. We'll gladly send one on approval to any of your plants for examination and trial.

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VUM 42

The Auburn Finish—II

By
C. E. HILKEY

Production Superintendent of the Auburn Automobile Co. (Connersville plant) describes the methods and illustrates equipment used in finishing wheels and sheet metal parts, such as fenders and hoods of the Auburn car

DRAWING all of the widely divergent threads of a 50-acre plant through the eye of the proverbial needle, which in our case is the assembly line, is an easy task—theoretically and mechanically; merely a matter of mathematics, blueprints, men and materials. But actually making the ends meet and continue to meet, thereby obtaining an even steady flow of finished parts, is the real job.

Our buildings and conveyor systems are planned according to accepted practice and installed to suit our individual needs. To further eliminate costly delays we have established semi-finished parts supply bases at strategic points on the sheet metal and wheel lines. These bases compare in purpose and operation with the two described last month in the body department, and they have proved to be very efficient.

The mixing room and central-pressure-tank supply room—feeding the sheet metal and wheel-finishing departments—contains 13 sixty-gallon colored lacquer tanks and 13 ten-gallon booster tanks; it is located in a brick building adjacent to the sheet metal and wheel department. This system is entirely separate from that of the body finishing department. Feed lines on both systems are placed in underground concrete tunnels which connect the various buildings.

Sheet metal parts comprise hoods, fenders, radiator and running-board flashing, rear fender aprons and running boards. Coming from the stamping department,

Snuff Out Paint and Enamel Fires this *Modern Way*

Several kinds of extinguishers will put out fires in the finishing shop. But the damage they do, and the mess they make often costs more than the fire itself.

The modern way to kill fire is with the Lux Extinguisher. Lux does no water damage... spoils no parts... and leaves no dirt. After Lux has put the fire out, the men go right back to work again.

Lux is a new development in fire protection. Instead of using harmful chemicals Lux smothers flames with Lux gas (carbon dioxide)—a clean, non-poisonous substance in which fire cannot exist.

Lux offers better fire protection for your finishing processes. Don't wait for fire to ravage your plant. Mail the coupon today for complete details, without obligation.

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these parts are run through a washing and drying machine. A boiling chemical cleaner, constantly agitated, cleans the metal surfaces and parts which, after emerging from the chemical wash, immediately pass through a short oven operated at 500°F.; here the parts are thoroughly dried. Leaving this oven, which is virtually a part of the washing machine, the parts pass through a cooling tunnel and are removed from the conveyor at the outfeed end and inspected. Any traces of grease or rust remaining are hand cleaned with lacquer reducer.

Sheet Metal Finishing

We use two classes of sheet-metal finish—lacquer and baked enamel. Both color and specifications determine the process employed. The lacquer finish process is as follows: These parts are dipped in an oil primer, and suspended by wire hooks on an overhead conveyor to drain as they slowly pass from the dipping room into an oven where they are baked for 40-min. at 350°F. On leaving this oven, the metal surfaces are dry sanded with No. 240 sandpaper and again placed on the overhead conveyor which carries them through a series of spray booths where four coats of lacquer are sprayed onto the sheet metal. After each coat of lacquer there is a short space for oven drying.

Following the last coat of lacquer the sheet metal, still on the conveyor, passes through approximately 60-ft. of oven at about 160°F. temperature. Outside the oven, the sheet metal is removed from the conveyor and sanded first with No. 320 sandpaper and finished with No. 400 sandpaper. The sheet metal is then wiped with a damp rag and returned to the conveyor, where it passes through the same oven at approximately 160°F. for complete drying.

Emerging from this oven (remember it is the same conveyor throughout) the sheet-metal parts, carried by conveyor, enter a mist coat booth where lacquer thinner is sprayed on to give the sanded lacquer a more even and smooth surface. After leaving the mist coat booth they pass through another low-temperature oven; then they are removed, placed on tables to be lacquer rubbed and polished with a special cleaner. Head lamps equipped with powerful blue bulbs are used to inspect the polished surfaces; parts requiring corrective labor are returned to the line, the others going to the stripers. We use striping machines

Lacquer storage room No. 1 . . . . 13 sixty-gallon colored-lacquer tanks and 13 ten-gallon booster tanks, etc.

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The masking tape with precision edge

Precision edge! That's the big reason why you can apply JONFLEX industrial tape more accurately. Whatever kind of stenciling or masking job it may be, you can depend on it that JONFLEX will adhere smoothly—without wrinkling or buckling. Thank the extra quality fine-woven muslin for that.

JONFLEX requires no processing for lacquer work—another saving of time for you. Neither does it require warming or coaxing to adhere, or strip off when you want it to. It comes off in a single ribbon—no sticky bits of adhesive remain behind.

A single trial will sell you on the merit of this really fine Johnson & Johnson product. Send the coupon for a sample roll of JONFLEX free. *Do it today.*

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Please send free sample roll of 1-inch Jonflex Industrial Tape.

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wherever possible, and of course hand stripe those parts on which the machine is impractical. After drying, these lacquer finished sheet metal parts are placed on another overhead conveyor which delivers them to the assembly lines.

Sheet-metal parts to receive an enamel finish are cleaned, as herein described, and enter the first dip room. The dip rooms and baking ovens are all connected by overhead conveyors; the process is very simple—a matter of dipping the parts suspended by wire hooks, then hanging each part on the conveyor to drain as it slowly passes from the dip room into the oven. We dip all enameled sheet metal three coats, baking the first coat 45 minutes at 450°F., the second 45 minutes at 460°F., and the third coat the same time and temperature as the second. After these parts have cooled sufficiently, they are inspected and sent to the assembly lines.

Wheel Finishing

Our wheel-finishing department, shown in the accompanying layout, is located in the same building with the assembly lines and paralleling these lines. The line of travel however is opposite to that of the assembly lines, placing the rim and tire assembly station just ahead of the main assembly lines and at a point where the chassis line enters the building.

There is no trucking of wheels at any time, all transferring being done by power and gravity conveyors. Of course, all of the spray booths in this department are fitted with an axle and bearing on which the wheel is placed so that it may be easily turned while being sprayed.

The first operation consists of spraying a coat of oil primer over the entire wheel which is then

Above: Continuous conveyor equipment where metal parts are automatically cleaned and dried.

Left: Dipping tank for sheet metal parts, fenders, etc.

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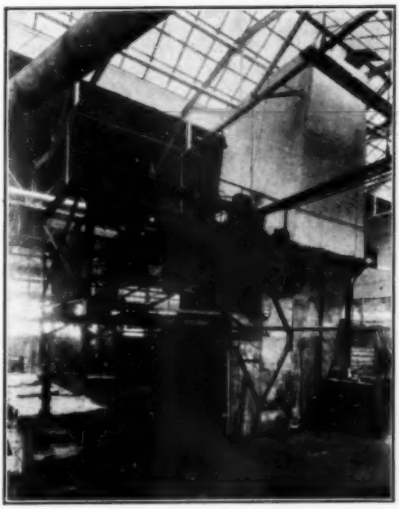
K & B Continuous Conveyor Enameling Oven . . . .

first of its kind ever built, speeds up finishing, and makes big reductions in labor, heat and space.



John P. Morgan, vice president of the Gemmer Mfg. Co., Detroit, says: "Our Kirk & Blum 70" continuous conveyor enameling oven saves floor space, occupying only 8 x 15 ft., one-tenth as much space as occupied by our old ovens; totally enclosed, we are never troubled with dust; heat is supplied by electric units, and the maximum current consumption is only 44.8 KW; these advantages and others not mentioned, combine to give us a yearly saving of $5,508."

Kirk & Blum engineers are experienced in the design and construction of industrial finishing systems—booths, ovens, conveyors and ventilators, etc.—for the furniture, automotive and other industries.

Detailed description of the Gemmer Mfg. Co. installation, and other facts concerning our facilities and service will be sent upon request. Submit your industrial finishing equipment problems to us!

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Detroit Factory and Offices: 4718 Burlingame
Pittsburgh Representative: The Bushnell Mchy. Co., 1501 Grant Bldg.
Louisville Representative: Liberty Blow Pipe Co., Inc., 917 S. 12th St.
Canadian Representative: Canadian-Rogers Ltd., Winnipeg and Toronto

KIRK & BLUM

Industrial Finishing Equipment

placed in a 30-ft. oven on a roll conveyor. As each wheel is primed and placed on this conveyor, all of the wheels in the oven are moved forward a distance equal to the diameter of a wheel. The temperature inside this oven is 140°F., and approximately 15 minutes is required for a wheel to pass through.

As the wheels are taken from the outfeed end of the oven they are dry sanded, using No. 240 sandpaper; then they are inspected and any rough surfaces are putty glazed. They are then placed in another oven—15-ft. long and operated at the same temperature and in the same manner as the previous oven—to dry the putty glaze. Leaving this oven, the wheels are thoroughly sanded, using No. 240 sandpaper.

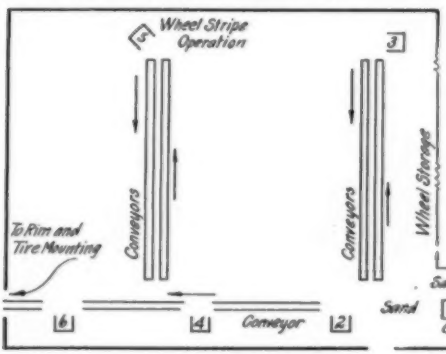
Wheels to be finished in black are sprayed in booth No. 2, while red wheels are transferred to a gravity conveyor going to booth No. 3 for a coat of red lacquer. These wheels are returned over the second gravity conveyor, transferred to the main line, and both red and black wheels receive a second coat of the respective colors in booth No. 4.

Leaving this booth, wheels are placed on the cross conveyor going to booth No. 5 which contains the striping machine, where the contrasting color of lacquer is sprayed on to make the stripe decoration. Returning over the other conveyor, wheels are again transferred to the main line and go to booth No. 6 for a double coat of gloss lacquer. After this final coat, the wheels are placed on the conveyor to be delivered to the rim and tire-mounting station.

Assembly; Touch up; Polishing

I might add here that after complete assembly of wheels, chassis, motor, body and sheet metal parts the entire finished metal surfaces are waxed and polished. Then follows the final inspection and touching up. The car is then road tested on the proving grounds, brought back, final adjustments are made and the entire finished metal surfaces are again waxed and polished before loading for delivery.

There is yet one thing that I would convey to the reader, the thing which I consider a vital necessity to the manufacture of a good automobile, or anything else for that matter, namely that every individual employee have a complete mental picture of the entire manufacturing process. Answer his question of, what becomes of my work? This knowledge will promote personal in-



Floor plan layout of wheel-finishing department, wherein spray booths are marked 1, 2, 3, 4, etc.

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Half-pint cans to 52-gal. drums.

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Red	No. 1201
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Blue	" 1206
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Aluminum	" 1212
Gray	" 1214
Gray	" 1217

G-E Glyptal Lacquers are *more than paint.* They protect and seal —tanks, pipe lines, motors . . . machinery, structural steel . . . the list is endless, in every industry.

Long-run cost is less because they need no primer, no sizer . . . one glossy coat does the work of two.

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Applied with spray-gun, brush or dip-tank, these lacquers dry dust-free in 30 minutes! Save time and labor.

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Refinishing Automobiles Lacquer-Paint Job

Automobiles can be refinished either in all lacquer materials or in lacquer paint combination which I have found is both rapid as to execution and satisfactory in durability.

First, all the paint must be removed from the job—and with so many different methods of doing this, it is only necessary to say here that it must be done thoroughly. A once-over with sandpaper, air and perhaps a tack rag will make the surface fit for the first coat, which should be a lacquer primer. This can be followed by from two to five coats of lacquer filler, according to the condition of the metal, with or without a guide coat—according to skill and training of the man who does the rubbing. Then a good reduction of this surface to leave it with the minimum of material and maximum smoothness. By what special process this condition is arrived at—whether by Wetordry sanding, rubbing stone, or by the ancient method of using lump pumice stone, it matters little so long as it is reduced until one more swipe would go through, "but do not do that."

Now when you have progressed this far, you have a thin film of lacquer primer as hard, or almost so, as the metal—with a fairly hard but still absorbent filler or surfacer supposedly stuck fast to this primer. From here up we can use two to four or more coats of pigmented lacquer, rubbing between coats, or we can use a modern quick-drying color varnish as per the following recommendations:

Make up a ground coat of say the final color, reduced with 25% 4-hour (or 2-hour) rubbing varnish, the balance turpentine for thinner. If the surface has been brought up in filler closely approaching the final color, this ground coat will dry and cover solid and will act as the old sealer and ground coat of the varnish days. Upon this flow a tinted coat—made in the proportion of 4-oz. of color to one pint of the same 4-hour rubbing varnish; when dry this is to be flattened, striped and finished with a finishing varnish that will dry absolutely hard over-night. The result is a full-bodied high-luster job with what I believe is as few coats as it is possible to use to gain these results, and "with so little on, it is impossible to knock it off unless you run into a barb wire fence."

There are now on the market, made by some of our best firms, rubbing varnishes that will dry to rub clean and without sweating in four to six hours (or less), and finishing varnishes that dry so hard overnight that you cannot "print" them. With these, an experienced automobile refinisher can do all that I have claimed and more.—A. F. Eibell.

Plaveczky Now With Hoboken White Lead & Lacquer Co.

Dr. Emil Plaveczky has joined the Hoboken White Lead & Lacquer Co., Hoboken N. J., and will direct the research laboratories of this company. He is a specialist in the development of industrial finishes and has had many years of research experience.

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Cleveland, Ohio

Developments in Vitreous Porcelain Enameling Industry

Brief notes about the development of vitreous porcelain enameling from a modest beginning to the well equipped specialized production departments wherein continuous furnaces are employed to good advantage.

By
*R. C. HARMON**

ENAMELED WARE manufacturers, as well as those manufacturers who contemplate porcelain enameling, may be interested in a general outline of the major developments that have taken place in the enamel industry in America.

First, as to history, enameling is an art almost as old as civilization. It originated in the Nile Valley, flourished in China as early as 1500 B.C., and later was introduced into Europe where it became a medium of the jeweler's craft. Specimens existing today indicate that porcelain enamel played an important part in the culture, luxury and art of the Middle Ages.

From a jewelers' art to practical, every-day use was a drastic and precarious jump, but none-the-less one that gives enameling today its interesting background. Pallissy of France was accredited with first applying the finish to metal. Austrian, Russian and German manufacturers gradually commercialized the art, and it was largely the German influence that brought it to the United States.

An earlier type of vitreous porcelain enameling furnace, showing box-type design and hand-operated fork.

Forty-five years ago there were but a dozen or so porcelain enameling shops in this country. There are now more than 300. At first these were devoted almost exclusively to sheet-metal articles such as cooking and kitchen utensils. One of the larger manufacturers was the Vollrath Co., in Sheboygan, Wis.; another was National Enameling & Stamping Co., which company then had factories in the state of Connecticut and in the city of Baltimore.

It was not until several years later that enameling upon cast iron became practical. It is to

*With The Ferro Enamel Supply Co., Cleveland, Ohio.

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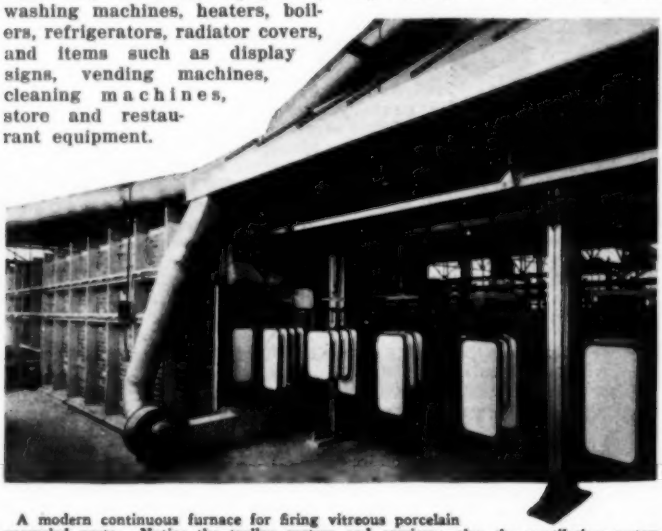
this achievement the industry owes much of its development. Demands for this type of work led to the mechanization and speeding up of processes. Vital improvements came in the silicon-carbide refractory muffle, which fired the ware nine times faster than the old-style clay refractory muffle, in automatic loading and unloading devices, automatic continuous driers, and in the use of oil and gas instead of coal for furnace firing.

These improvements in turn provided an incentive for sheet steel production . . . the equipment was suitable for both kinds. And, of course, in later years manufacturers have favored the use of light sheet-steel parts for their work. That has brought a veritable era of enameled appliances such as stoves, ranges, cooking utensils, kitchen and bathroom wall tile, electrical equipment, washing machines, heaters, boilers, refrigerators, radiator covers, and items such as display signs, vending machines, cleaning machines, store and restaurant equipment.

This volume in keeping with modern trends has created a tendency for lower prices; and this tendency brings to us the latest development in the vitreous porcelain enameling field—the continuous enameling furnace.

One of the first installations, a double-end type, was made in a stove shop about ten years ago. It was abandoned, eventually, being too expensive to operate. Subsequent failures resulted, until finally, six or seven years ago some successful jobs did go into operation. Among them were three high-production electrical units, producing "Arcola" type heaters.

These, as well as later installations, are of the "single-end" or "hairpin" design. The ware enters and leaves at the same end of the furnace. This is accomplished by means of a conveyor chain traveling through the necessary heat



A modern continuous furnace for firing vitreous porcelain enameled parts. Notice the trolley system and carriers; also the ventilating system.

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zones. Total length of chain travel averages 150-ft., while the temperature in the firing zone averages 1600° F. The ware, as it emerges from the furnace, is cool enough to handle.

Within the last two years more than 50 "single-end" type furnaces have been built. A prominent iceless refrigerator company operates nine; another iceless refrigerator company has six, three of which are electrically heated, while 3 are fuel fired. Each furnace is capable of producing some 3,500-sq. ft. of sheet-steel enameling an hour. Savings effected in these furnaces figure as high as $100 a day for each furnace, depending, of course, upon conditions in the shop.

The next major development in the vitreous porcelain enameling industry is hard to predict. For the present, however, there will most likely be interesting improvements in spraying, dipping, pickling and other processes. These will be made to further curtail enameling costs, and to supplement production advantages made possible through the continuous furnace.

Clean and Dry Metal Surfaces

Some months ago, in an article under the above title, Mr. Fred Mannhardt recommended the practice of washing metal surfaces (to be finished) with gasoline. Gasoline, as we all know, is not particularly recommended by fire insurance underwriters for use in paint shops; also the cost of gasoline is much higher than that of naphtha.

Then Mr. Mannhardt goes on to suggest that the gasoline-cleaned metal parts be placed in a drying room or oven and subjected to "a temperature a few degrees higher than the hardest coat to be baked." I contend that this operation is absolutely unnecessary; a paint shop on a production basis cannot afford this extra time, nor the waste of the valuable floor space in the drying room or oven. For operating a modern paint shop on production basis, and for the convenience of employes in that department, I would suggest that a trough or container be built, the size being about 3x10-ft., depending on the size of the articles to be washed and painted.

A drain rack can be provided on either side of the container to allow excess naphtha (which will drip from the articles washed), to run back into the container. This container can be placed as near the prime spray as possible without causing a jam or confusion. It is also advisable that an air duster be placed close to this container. Then one or more pieces can be placed in the container, washed properly and placed upon the drain rack.

Now take the first piece washed and blow it with compressed air, directing the jet of air into all cracks, grooves, seams, and crevices, to remove all naphtha lodged therein. After this is done, wipe the entire surface with a dry cloth and then place upon a rack, truck or conveyor—whatever your handling or transfer system may provide. Deliver the articles to the prime spray and, when their surfaces are primed, transfer them to the drying room or oven.

If an oil primer is used, allow the articles to dry 36 to 48 hours at about 190° to 290° F. Then deliver them to the sanding room where the surfaces can be filled and sanded; they are ready now to advance to the spray booth

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where the surface coat or final color—or whatever final finishing material may be used—is applied. Following this operation, the articles are delivered to the station where the surfaces are to be rubbed, polished, striped, "decal'ed" or decorated in whatever manner is required. Then deliver them to the final assembly, crating room or warehouse.

This production system, I believe, will enable the foreman to keep all products moving progressively through his department. If these operations are followed with proper precautions he can be assured that his primer will not lift when spraying lacquer. This in turn will increase production, save much valuable floor space and, last of all, be of much convenience to all paint shop employes.

Since the entire 48 states seem to have gone mad over production, I find that there are many paint shops sitting in the dark because of lack of supervision and proper handling of the products they are manufacturing. As we all know, a loss of time means a loss of money to the operation of a department.—Geo. Heidenreich, Jr.

Finishing Metal Carpet Sweepers

Despite the popularity and wide use of the modern electric vacuum cleaner, the demand for the "old fashioned" carpet sweeper shows no apparent decline and the task of finishing metal carpet sweepers on a production basis is one of my interesting experiences.

Sweeper cases are delivered to the finishing room from the assembly line in the punch-press department. The cases are placed in tiers on specially constructed trucks, each holding 100 cases; then to the spray booths where the primer coat is put on.* After the application of the primer coat, the trucks of cases are pushed into the baking ovens. The average time for a bake is four hours at 225°F. The length of time and degree of heat for baking varies with the production schedule.

The cases must be sanded smooth and cleaned prior to the application of the wood-grain reproduction. In the graining department the cheaper cases are grained by hand, the operator using various tools and brushes. The better cases are grained from copper-plate reproductions of the grain desired—mahogany, walnut and oak being the standard grains used.

The cases are then either placed in an oven to be baked, or left in a dry room overnight, this being dependent on the production schedule; then they are cleaned and sprayed with the first coat of varnish, followed by another baking. In preparation for the next operation, the cases are lightly sanded and the special stencils, trademarks, decalcomanias, etc., are applied.

The cases are given a final cleaning, touched up where necessary, and the final coat of varnish is sprayed on and baked as before. Prior to delivery to the sweeper assembly department, cases of the better grade are given a light water rub. The final polishing is done after assembly.—D. M. Martin.

* Cleaning of the metal cases by chemical cleaners, followed by a hot water rinse, occurs prior to delivery to the finishing room.

Finishing by production methods makes possible uniform low cost results.

ADVERTISING PAGES REMOVED

Questions and Answers

This service department is conducted to meet the reader's need for prompt information on specific problems, and to give others an opportunity to review the questions and to offer comments, suggestions or answers

Spraying Steel Drums in Three Colors

Can you give me information on how to spray steel drums in three colors in one or two operations.—F. V. W.

The first method that comes to mind is to use masking tape or paper to shield other sections while spraying each color, as in automobile finishing and refinishing. Spray the center first, letting the spray overlap into the other sections so that the midsection color will come full strength to the lines above and below it all the way around the drum. When dry, mask this center section and spray the two remaining colors on the end sections, using care to avoid letting spray dust spoil the second color when the third or last color is applied.

Another suggestion is to make a cup-shaped sheet-metal mask a little larger in diameter than the drum, so that it will slide over the top of the drum. Then spray the top section, and when it is dry, shield or mask it with the cap to protect the upper section from the spray while the midsection is being sprayed. When the midsection is dry, turn the drum upside down and mask the midsection with masking tape and paper to protect it while spraying the remaining end section.

Probably the fastest and most economical method is to make a galvanized tin mask the width of the center band and long enough to reach around the drum. This mask fits around the drum and is held in place by one or more thumbscrews. The midsection of the drum is sprayed first without the mask. When dry, the mask is placed over it and the two end sections are sprayed—one in one color and the other in another. For sharp lines it will be necessary to clean this mask often.—F. C. L.

Finishing Metal Dials

We enclose a small metal dial which we manufacture and which has always been enameled by spraying. (A slightly concave disc about 18-gauge metal, 1 ⅛-in. in diameter, ½-in. hole in center, with indented dial marking, all in black.) Do you know of any process by which this dial can be tumble coated? This dial has had two spray coats on each side, and each coat is baked.

As you realize this process is very expensive, and we would like to find some method of cutting the finishing costs. These metal

pieces are all cleaned in chemical washing cleaner, then back sprayed and baked, front sprayed and baked, back sprayed and baked, and front sprayed and baked. The dial must withstand 100 hours salt spray test, so you can see it must have a very thorough hard coating.—C. Mfg. Co.

I suggest the following schedule:

First, hang dials from rod and dip in black sealing primer, reduced with turpentine, and bake at 300°F. for two hours.

Second, set up and spray on the face a coat of dead-black baking japan, and bake at 350°F. for two hours. This will produce a fine finish that will stand the salt spray test.—A. J. B.

Wavy or Wrinkly Finish on Birch

In finishing birch, we proceed as follows: spray water stain, either walnut or mahogany, then wash coat shellac, sand, second coat shellac, sand, first coat varnish, dry for 48 hours, sand, second coat of varnish, dry for 48 hours and oil rub. Using this finish we find that the finished surface has a wavy or wrinkled appearance after rubbing. At times this condition is visible when the varnish is dry and before rubbing. We enclose sample showing these defects.

We have experimented as follows to eliminate this trouble: Allowed the first coat of varnish a 48-hour drying period: then sand; then let the work stand overnight before spraying the second coat of varnish; used P. & V. M. naphtha for thinning the varnish instead of turpentine (this reduced the trouble somewhat); tried flowing the varnish on with a brush; made a special effort at inspecting the wood in the white to make sure the surface was perfectly smooth before finishing. We tried the same varnish on glass and the wrinkles or waves did not show up.—M. S. C.

In my opinion there are minute depressed areas in the panel made by small shavings and dust that collect on the panels during the machine work; then, when one panel is piled (or stacked) on the other, this pressure causes these particles to become compressed and pressed into the surface of the panel in small areas or spots. When sanded, the surfaces become smooth and it is not until water

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stain is applied that the depressed spots rise and cause unevenness on the surface. Finishing coats and succeeding finishing coats only magnify this roughness.

I would eliminate the second coat of shellac. My schedule would run as follows: 1—stain; 2—wash coat; 3—sand; 4—wash coat filler (6-lb. paste filler cut with one gallon naphtha); 5—then apply two coats of varnish or one coat of shellac and one coat of varnish.—M. A.

The finish seems to be too heavy—all coats—especially the shellac. One coat of shellac is plenty for this finish. The shellac coat should be cut as follows: 4½-lb. cut reduced 50/50 with alcohol. This will give a 2¼-lb. cut of shellac. If the orange peel is still present, instead of P. & V. M. naphtha try Oleum spirits (product of the Standard Oil Co.) This will not set up quite as fast, but it will not affect the drying time. Of course, there is the possibility that there is not the right type of varnish being used, but I could not recommend a change in the varnish without being on the ground.—M. G.

Finishing Yo-Yo Tops

We would appreciate information regarding the best and cheapest method for finishing toy articles (half-sections of wood "Yo-Yo" tops) a section of which we are enclosing. These must have a brilliant glossy effect either in transparent or solid colors, and

it is desired to finish them by tumbling methods, as we have found our present method of assembling them on racks and dipping them in lacquer is too slow and expensive. Neither are we able to get the gloss desired unless two coats are used, which runs the cost up to a prohibitive point.—B. Toy Mfg. Co.

My suggestion is: First place batches of the parts in wire mesh baskets and dip them in a water solution of silica of soda. Let them air dry overnight and then smooth them up in a wooden tumbling barrel.

Second, tumble on a coat of gloss, air-drying, tumbling enamel of the color desired.

Third, tumble on a coat of clear, gloss, tumbling varnish, if a higher luster is desired. Of course, a closed wooden tumbling barrel must be used; not metal.—A. J. B.

Uniforming Sap Walnut

In getting out special interior trim and fixtures, we use 4/4-in. American walnut lumber. Of course, most of this is steamed and the sap wood varies from all shades of gray to light browns. We are having difficulty in finding a satisfactory stain and method of staining this sap so that it will not show up in the final finish. Of course, we could buy lumber which is free of sap, but on competitive jobs the price of such lumber would be prohibitive.—R. M. S.

I recommend that the wood be filled before staining. Use a suitable combination filler that will produce the proper color. This will leave the sap light, of course. Then use sapping stain, either

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spraying or brushing it; spraying is preferred, as more uniform results can be obtained. By using combination filler you bring out the correct color as gauged by filler color. These sap streaks should be touched up with either lacquer or spirit stain, spirit sapping stain being my preference.—J. M.

Lacquer Enamels Crawl

We would like to know why lacquer enamels crawl or creep away when applied on top of a wood sealer coat. We are having trouble with black, blue and red. Have tried thinning the sealer and enamels, but find results same.—L. Metal Mfg. Co.

Varnishes and oil enamels will crawl when applied to an oily or greasy undercoat, and I presume that the same principle may apply in lacquer. Under these circumstances, I would recommend a change in the type of wood sealer coat used.—A. J. B.

Solid Enamel on Fir

Please let me know the simplest way to get a solid enamel finish on fir wood. The grain creeps through every time I attempt it.—D. Z. R.

Fir wood is a light weight wood—soft, strong and close-grained. It absorbs all finishing material rather uniformly and makes an excellent foundation for enamel finishes. But here is the important part:

Fir should be finished just as soon as possible after it has been made up into a factory-made article in the white. Ordinary moisture in the air will cause the

grain of the wood to raise into ridges, and this roughness is almost impossible to cut down with sandpaper. This may be your trouble. You may be letting dampness get into the fir, or letting it stand too long before it is finished.

I might also state that if you use a primer on the fir before it is finished and then sand lightly, you will have a perfect foundation for your enamel finish. The primer I use for this purpose is sold as a "walnut bleaching lacquer."* This material seals the pores and, when sanded, it presents a smooth surface. It also holds back the wood oil and the different substances which otherwise would come through in time and discolor the enamel finish.

By this process of finishing you will find that your cost will be less because you will not have to sand the first coat of enamel. This bleaching lacquer can be sanded with a few strokes, while it takes a great deal of time to properly sand enamel.—T. R. Nall.

To secure a satisfactory enamel finish on fir: First apply a full-body coat of clear wood lacquer primer. Second, sand smooth. Third, apply enamel coats of oil or lacquer, and for a refined finish rub down with pumice and water. —A. J. B.

---

*Name on request.

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"Dutchman" to the balance of the seat. When it is completed, that is, varnished, the "Dutchman" stands out like a different piece altogether. Please advise how we can overcome this condition, as it makes the article unsalable.—M. P. B. Mfg. Co.

We recommend the following plan:

Should the defect be in the front or rear of the seat, in applying a new piece—same not interfering with the hole in the seat—we either try to spoke shave it or add the new piece. If unable to do this, we burn in the defective place with stick shellac which we find much better than trying to repair with splines or Dutchmans. We have never had any success in using blocks or splines in the repairing of seats and covers unless we can run it the full length of the part that is to be repaired.—Knott Mfg. Co.

Bleaching With Oxalic Acid

In restoring old discolored woodwork to its original color, oxalic acid is recognized as the ideal agent for the purpose. The theory, as propounded, to prevent oxalic acid from acting on subsequent finishes, is that vinegar should be used to neutralize same. This theory is entirely wrong, as practical experiences have so proved. The base of vinegar is acetic acid and according to chemistry one acid will not counteract the action of another acid, therefore, a re-agent must be used to accomplish this.

The re-agents for acids are alkalies. It would be impossible for the practical painter to just gauge the proper amount of alkali re-

quired to neutralize the action of oxalic acid, therefore, it is advisable to use a chemical having just sufficient alkaline reactions, but not sufficient to harm the final finishes. My recommendation has always been to use a chemical which would accomplish the result. A weak solution of borax is the most practical and easiest obtainable medium for the purpose. —Geo. Whigelt.

Colors Identify Contents of Piping

After reading the Question and Answer in February issue, under the above title, I feel prompted to submit our color schedule for pipe lines. Although we use this in office buildings, it is equally applicable for industrial use. Typical specifications are as follows:

The various pipe lines shall be identified by an additional coat of paint to that specified above of lead and oil, graphite or other appropriate paint, in the colors scheduled below:

Fire lines, including fittings complete	
Turkey or "Fire" Red	
High pressure steam	White
Low pressure steam	Canary Yellow
Exhaust steam	Dark Brown
Cold water	Gray
Hot water	Salmon
Drinking water	Copenhagen Blue
High pressure returns	Light Green
Low pressure returns	Orange
Vacuum returns	Tan
Compressed air	Dark Ormyrtle Green
Oil (fuel)	Crimson
Gas	Navy Blue
Refrigerating lines	Aluminum
Electric lines	Black

In large rooms which are well lighted, and where the functions of the exposed pipes are obvious, all pipes shall be painted to conform to the color scheme of the room; and if it is desirable to distinguish pipe systems, color shall be used only on flanges and on valve-fitting flanges.

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Where pipes pass through rooms without any valves, flanges or fittings in the lines within the room, paint two narrow bands of the distinguishing colors around the pipes where they enter and leave the room.

In other parts of the building, such as boiler room, basement, etc., all pipes (exclusive of valves, flanges and fittings) except the fire system, shall be painted black, or some other single, plain, durable, inexpensive color.

The edges of all flanges, fittings, or valve flanges on pipe lines larger than 4-in. inside diameter and the entire fittings, valves and flanges on lines 4-in. inside diameter and smaller, shall be painted the proper distinguishing color.

For pipe lines in pipe shafts and similar places, where it is hard to follow along the pipe between fittings, etc., paint the entire lines the proper distinguishing color.—J. E. Rhodes.

Caused Cloudy Finish

I recall one case of cloudy finish which was caused by using a poor grade of sealer over the filler, and this sealer was cut too much; when the flowing double follow-up coats of lacquer were applied, the lacquer cut through the sealer and bled the color out of the filler in spots, causing a very ugly finish. This was remedied by using a better sealer and giving it more time to dry before lacquer was applied.—M.V.L.

It is hard to tell just where style in furniture originates. The important matter is to realize that style, wherever it originates, is the predominating element.

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New Materials and Equipment

Presenting briefly, certain outstanding features of new materials and improved equipment which have been developed for use in modern industrial finishing departments

Multi-Color Airbrush

The illustration with this article shows one of the new Paasche Universal Multiplehead Convertible Multi-color airbrushes for applying 2, 3 or more colors at the same time under the same accurate control as with standard universal airbrushes.

Each color is controlled independently so that all colors may be applied at the same time or shut off at will—also providing from finest line to widest spray under perfect control. Multi-color Airbrushes are made for use with 2, 3 or 4 colors, and may be used as single units or expanded into gang units of any number of airbrushes manually or air operated.

A 3-in-1 combination

In calling attention to this new development, the Paasche Airbrush Co., (1921 Diversey Parkway, Chicago, Ill.) declares that these Multi-Color Airbrushes "make possible many new, rare and artistic decorative effects on all products and with all coating materials at high speed and low costs. Users that have standardized on Universal Multiplehead Convertible Airbrushes benefit from the advantage that 90% of the parts of Multi-Color Airbrushes are interchangeable with present equipment (of the same make) thereby reducing cost, simplifying handling and obtaining excellent results."

Motor-Driven Air Compressor

The Bury Compressor Co., (air & gas compressors; vacuum pumps) Erie, Pa., submits the accompanying illustration to show its latest design, two-cylinder, vertical, single-acting, single-stage, water-cooled, motor-driven compressor directly connected with flexible coupling to the motor . . . . all mounted on a substantial sub-base as a complete unit occupying the least possible floor space.

This compressor is so designed as to provide complete and copious flood lubrication, and so as to use a very small quantity of oil. This is the result of the special design which prevents the excess oil getting into the air cylinders.

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requires ***no sanding . . no wash coat*** of shellac. Is a quick drying . . . . quick and deep penetrating stain, made only from water aniline colors which are fast to light.

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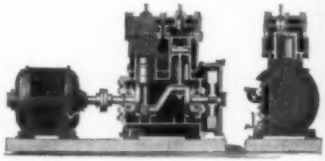


10-h.p. 1200-r.p.m.; 60-cu. ft. per minute, 100-lbs. air pressure

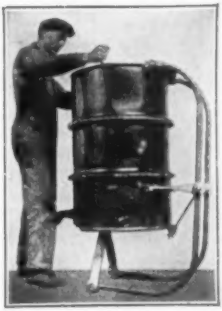
vided with an automatic electric stopping and starting fly-ball governor, unloader used for starting and stopping of the unit, electric pressure switch and automatic water valve, where there are long intervals when the machine will not be needed; when the predetermined pressure falls, it will automatically start up the motor and when the motor reaches full speed the compressor will be thrown into action and air compression resumed.

An enclosed balance wheel makes the machine run smoothly and prevents any possibility of entanglement with any object with which it might come in contact through carelessness. The valves are simple and of "pyramid box plate type." Machine is perfectly quiet in operation.

Super-Lustre Cream

A new product, called "No. 7 Super-Lustre Cream," has just been announced by E. I. du Pont de Nemours & Co., Inc., makers of No. 7 Duco Polish, and other specialties in the No. 7 Line.

Specify delivery of Pigmented Finishing Materials in FARRINGTON MIXER-DRUMS



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(Signed)
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This product is a soft, white paste, made from an emulsion of waxes, oils and other ingredients, and is intended for rubbing on automobile and furniture finishes after they have been cleaned and polished. It fills the pores of the finish and leaves a dry, hard, transparent film. This protective film, it is stated, lasts for months.

The company states that the new product can be applied in half the time required for hard waxes and does not require strenuous rubbing. Nevertheless, it produces the same high gloss as developed by wax polishes and will retain its luster just as long. It leaves the surface smooth and dry, with no greasy film to show finger marks. It does not rain spot, and even when the car gets muddy, the mere washing of the finish and rubbing with a chamois cloth will again restore its luster.

No. 7 Super-Lustre Cream is not a substitute for No. 7 Duco Polish, the company states, but is to be used in connection with that product. No. 7 polish removes traffic film and weathered pigments, restoring the finish to its original color and luster. No. 7 Super Lustre Cream preserves the luster and protects the finish. Old car finishes, which have become dull and dead looking, can be readily revived by giving them a good cleaning with No. 7 Duco Polish, and a rub down with No. 7 Super-Lustre Cream, it is claimed.

The cream is suitable for use on all automobile finishes, including Duco, lacquer, baked enamel and varnish. It is also well suited for use on furniture, linoleum, hardwood floors and other polished surfaces.

The interpretation of style is largely a problem of forecasting.

Read how this Firm Doubled Production!

One of the finishing booths in the plant of the California Tub Mfg. Co., Los Angeles

The California Tub Mfg. Co., of Los Angeles, manufacturers of wooden tubs, recently equipped their finishing department with SPRA-MORES. Read what Mr. Chopper says:

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Lacquer For Wood Finishing

By
M. C. ROBERTS

A lacquer chemist's notes about the characteristics of wood surfaces, fillers and stains, along with his comments upon lacquer undercoats and surface coats as used in modern production finishing.

A LARGE percentage of nitrocellulose lacquer failures are indirectly due to improper application, or insufficient care or time in surface treatment. In order to obtain the greatest degree of service, it is essential that the protective coating be properly applied; this is not only true of lacquer coatings, but of any type of protective coating.

Lacquers contain nitrocellulose, solvents, gums and plasticizers so controlled in structure in view of the use to which the application is recommended. Products so formed have the affinity of drying by evaporation of the volatile solvents only. It is essential that the binding qualities of such a product to the surface be exceptionally good, as on this phase alone depends the film-building properties.

Nature of Wood

The surfaces of articles made of wood usually show more or less grain and, as is the case when a wood finishing lacquer is applied by spraying, the lacquer in drying has the trait of pulling into the pores of the wood and thereby firmly attaching itself to the surface. Transparent wood lacquers do not have enough solid matter to fill the pores of the wood, although a film of nitrocellulose lacquer is very strong and, as compared with that of oleo-resinous type film, its tensile strength is much greater.

The usual oleo-resinous type of coatings have a tendency to "skimp" over the wood pores, while the nitrocellulose type of material firmly roots itself into the wood pores. As the coatings are applied and as the film thickens, it is reasonable to assume the presence of a force that tends to uproot the film, after the succeeding first-coat application, while the basic coating does not appear to be affected.

Recently, low-viscosity nitrocellulose has been available which has helped toward a greater solid content and hence greater film-building properties. Care should be given the wood itself before application of lacquer coatings, as this phase is equally as important to a satisfactorily finished wood surface. It is absolutely essential that the wood surface be clean and free from grease and all foreign materials. Cleanliness of the surface will insure satisfactory adhesion and eliminate peeling.

Fillers; Stains

In view of the porousness of wood surfaces, it is essential that a paste wood filler be applied to

A Revolution in Lacquer Application!

Just as hand brushing gave way to the spray gun, so the coating machine is to supersede the gun in applying lacquer to paper, cardboard, composition and metal in sheet form. Increased speed in application and a great saving of finishing material will bring the change to the machine.

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Brevolite Coating Machine Lacquers in clear and colors are not ordinary spraying materials "modified."

They are the pioneers in this new method of lacquer application and have stood the test on actual production work.

If you are finishing any articles in sheet form we have some information about coating by machine that will be of interest to you.

Brevolite Lacquer Company

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(W. H. Rohr, Ind. Fin., Jan., 1930)

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Model PSE-30 can also be furnished with a heavier duty, all metal, pressure feed type gun at $69.50. This produces results equivalent to ½ or ¾ h.p. paint spray units. Sprays both light and heavy material with equal efficiency.

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level the surface. The first step, however, before the application of paste wood filler, is to apply a stain. These stain colors represent dye powders. There are three main types of stains classified as water-soluble, spirit-soluble and oil-soluble stains. Of the three given types, water soluble stains are probably more extensively used. They represent aniline dye colors that are soluble in water, fast to sunlight and permanent in color. These properties are not found in any spirit and oil soluble stains that I know of. The usual mixture is made up in the proportion of about 4 to 8-oz. of powder to a gallon of water. However, the amounts are varied in accordance with the strength of the desired solution.

Water-soluble stains have a tendency to raise and stiffen the grain of wood, this producing a rough or fuzzy surface which must be smoothed by sanding. To make the sanding operation more effective, it is usually recommended that a very thin sealing coat of reduced wood lacquer (usually the finishing lacquer reduced about 200% with the recommended reducer) be applied and allowed to dry before sanding. This treatment stiffens the wood fuzz and raised grain so that the sandpaper will cut more effectively.

Another type of stain (very seldom used) is a chemical stain which depends on chemical reaction to produce the desired effect. The stained wood should be allowed to dry at least one hour (in most cases a greater time is in order) before the application of filler.

Recently there has been introduced a stain that does not raise the grain. This should help tremendously toward the elimination

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XCEM is a tested cleaning material affording a simple, safe, efficient and economical method of removing accumulations from spray booths. Developed to meet specific needs in the automotive industry, XCEM now finds unlimited use in all industries where finishing materials are applied—it cleans spray booths, spray guns, paint brushes and pots, metal parts and removes old finishes, etc.

Reduces Fire Hazards
Improves Working Conditions

Unclean spray booths present a fire hazard that should not be tolerated. Any moment, the accumulation of lacquer may become a menacing flame to spread and stop production. XCEM easily cleans spray booths, making the job an economical one from standpoint of time and cost. Clean spray booths also contribute to better working conditions, lessen waste and eliminate minor defects in spraying. We will be glad to demonstrate XCEM at your convenience, without obligation.

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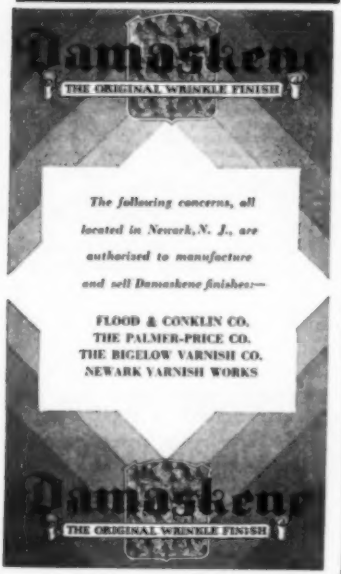
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of sealing and sanding operations. These stains have penetration properties and other desirable features of modern types of wood stains.

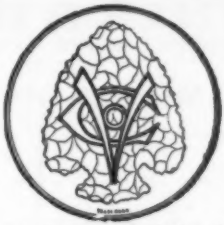
The proper type of filler to use under lacquer should be a product that has no affinity for or with the solvents employed in the structure of the lacquer; this also holds true of spirit-soluble stains. The filler should have a minimum of gum solvents. The use of the right type of filler, properly applied, will eliminate many finishing troubles. A certain type of fast-drying wood filler has been introduced recently which should hasten production considerably; these fillers have every desirable property of what has been considered the ideal type of filler for wood.

Undercoater; Wash Coat

Time and money spent in the preparation of wood surfaces to be finished means dollars saved. Before work leaves the cabinet room it should be sealed with a sealer coat of "sanding undercoater." This product, as its name implies, is a lacquer so constructed as to produce satisfactory "tooth" under sandpaper, holding the qualifications of a true binder to the filler. A "wash coating" of shellac is sometimes used for this purpose, although the recommendation of the manufacturer of the finishing lacquer should be given due consideration. In all probabilities this recommendation would include a properly-balanced product for the purpose of securing ideal knitting qualities with the finishing wood lacquer.

Clear Lacquer

There are many nationally-known brands of clear wood lac-



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quers. It should be remembered that lacquer dries by evaporation of the volatile solvents contained. A lacquer should be well balanced and suitable for the work it must perform—in the use to which it is to be applied. Such troubles as blushing, blistering, pin-holing and loss of luster can be attributed partially to structure of product.

The conditions surrounding the actual application, drying and preparation of the filler or foundation are likewise essential to a satisfactory finish, as well as the manufacturer's recommendation of the proper type of reducer. The crying need in a clear wood lacquer is for film-building properties. Knowledge through experience and research is bringing lacquers into an enviable position, and clear wood lacquers of 30% and 40% total solids are the aims of the lacquer chemists.

The plant with the lowest costs can give the best money's worth—and will do the most business. Department costs are the unit toward computing complete cost.

Arco Selects Los Angeles for $200,000 Branch

The Arco Co. (paint, varnish and lacquer), Cleveland, Ohio, plans the immediate erection in Los Angeles, Calif., of a $200,000 plant to have an output in the first year of operation worth $2,000,000.

The company has acquired a tract of land 200x353-ft. in the Goodyear Tract and fronting on East 59th St. between Central Ave., and Avalon Blvd.

The factory buildings will include a paint manufacturing plant 100x100-ft., a lacquer plant 50x100-ft. and a varnish plant 30x60-ft. The largest building is to be of brick and steel construction and the others of reinforced concrete. All are to be one story in height.

This plant is designed to supply the Pacific Coast trade and export business.

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EDITORIAL

What Will Sell More Good Furniture

Today many furniture manufacturers are wondering where they can sell more furniture. They have spent time, thought and money in developing new and attractive designs, invested thousands of dollars in modern equipment, insisted on careful mill and cabinet work and finished their products properly with high grade materials. They have spent time and money in displaying their products attractively at the shows for the benefit of buyers.

Most manufacturers have road salesmen, but all of their investment, time, thought, care, plans and the money wrapped up in their product must pass through the neck of a bottle—the dealer.

If the furniture dealer waged as intensive and concentrated battle for the consumer's dollar as the dealers who really sell brick, cement, wallboard, stockings, automobiles, radios and electric refrigerators, there would be more furniture sold. What is the usual procedure? The dealer places an ad in his local newspaper, and waits to see what will happen. Usually very little happens when we wait.

A manufacturer of very high grade furniture got tired waiting for customers to come into the dealers' stores, so he hired a factory representative. The F. R. has ability. The plan he uses is to go to a city, see the dealer or interior decorator who handles the very best line of goods, and whose customers and prospects embrace those in his price class; he obtains the names of people who might be interested in furnishing a new home or replacing the furniture in the present home. The F. R. works on these prospects. *He does not mention price.*

The manufacturer furnishes the F. R. with a brochure—not a catalog. This book illustrates in color how the manufacturer's furniture will appear in a home. The factory representative's job is to explain the merits of the furniture, suggest harmonious ensembles either for the new home, or for the present home, with or without part or all of the present furnishings.

The F. R. apparently goes to a lot of trouble in reproducing the prospect's room or rooms, drawn to scale on a blueprint showing just how the new furniture will fit into the home. His ideas are good. He is more than a salesman. When the desire has been created in the prospect for new and better furniture, then the F. R. takes the local dealer's (from whom he received the prospect)

representative along; prices are quoted and the deal is closed.

That is what it takes to sell furniture or anything else. Combine advertising, intensive activity and real ability—and furniture will move just the same as other commodities which are being distributed by the same plan.

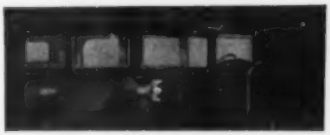
High Quality Finish and Artistic Effects

The production trained craftsman is concerned chiefly with economical production routine, and naturally he endeavors to standardize his work with as few operations and materials as possible. He is likely to take sides with production engineers against the designer, opposing the introduction of the new effects and technique which exhibit artistic expression.

To achieve higher standards of finishing the designer must be given more freedom of expression, and the finisher with an artistic eye and a skillful touch must be encouraged in every way possible. High quality work will always be in demand, notwithstanding the fact that many concerns do not know how to merchandise it profitably.

To Prevent Color Bleeding Through

To prevent anilines and other bleeding colors, from striking through paints and other finishing coatings a theory was advanced to accomplish this by applying a protective coating over such coloring matter. Shellac and similar gums, being soluble in alcohol and its derivates, have been used for the purpose. Practical experience has always proven the fal-



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lacy of such a theory. Alcoholic distillations are known to be strong solvents for bleeding chemical coloring matters and such solvents will act on those colors before the hardening of the shellac gum itself takes place, therefore, the coloring matter is drawn into this imaginary, protective coating before it has a chance to accomplish the result.

To gain the desired effect it is necessary to make the coloring matter harmless or insoluble. We may adopt a method of doing this by using the results of practical experiences gained by others not connected with our line of business. The textile industries, using almost exclusively such coloring matters, prevent the bleeding of same by using what is termed a mordant.

The most commonly known mordants or chemicals used for setting bleeding colors, are alum and copperas or sulphate of iron —commonly known as green crystal. There are numerous other chemicals used for the purpose, but they are not always easily obtainable by the finisher, particularly in out-lying districts. The application of a saturated solution of such mordants would inexpensively and effectively bring the desired results.

The advantages of the use of such chemical solutions are, an entire absence of any final reactions on subsequent coatings. When it is possible to do so, and particularly where paint or enamel is used for a final finish, it is recommended that after the application of the mordant a flat black, so-called coach black, ground in japan may be used as an undercoating. Any trace of bleeding color would be assimilated by the black and turn into brown. Brown

has not been known to give trouble to final finishes. As a matter of fact white or other light-colored bases will stand out better on a black underground than on any other priming coat.

Aluminum, mixed with a vehicle which is not considered a solvent for aniline or bleeding colors, has also proved effective in the prevention of bleeding. There are also several, ready prepared, sizing materials available to the finisher which contain effective mordants to overcome bleeding.—Geo. Whigelt.

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Geo. E. Watson Co's. New Catalog No. 52

Geo. E. Watson Co., (painters' and finishers' supplies) 164 W. Lake St., Chicago, Ill., is now mailing Catalog No. 52. This general catalog contains 32 pages, size 6¾x7-in. and profusely illustrates the complete Watson line.

Hilo Methods Bulletin M-A

The Hilo Varnish Corp., Marcy & Flushing Aves., Brooklyn, N. Y., has published its Methods Bulletin M-A entitled, "Storing, Mixing and Reducing of Varnishes, Japans, Enamels and Lacquers." This bulletin contains 8 interesting pages, size 5½x7½-in., and is punched for insertion in a loose-leaf binder.

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Perfectly balanced, non-tiring, strong, serviceable AND light in weight, (2 lbs.).

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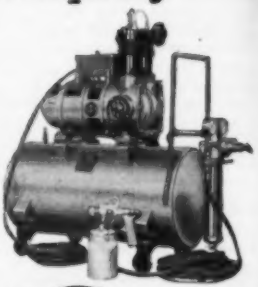

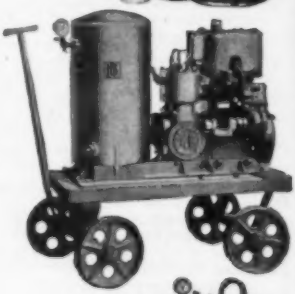

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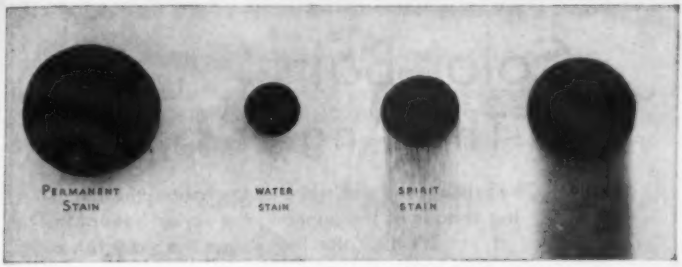

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Third, they show the "bleeding" of Oil and Spirit Stains and the fastness of the Water and Permanent Stains.

Murphy Permanent Stain approaches the ideal—It dries to take filler in a few minutes, and leaves no foreign residue.

It does not raise the grain of the wood

It penetrates deeply and rapidly

It does not bleed

It is fast to light

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